The IRON AGE

July 11, 1957

The National Metalworking Weekly

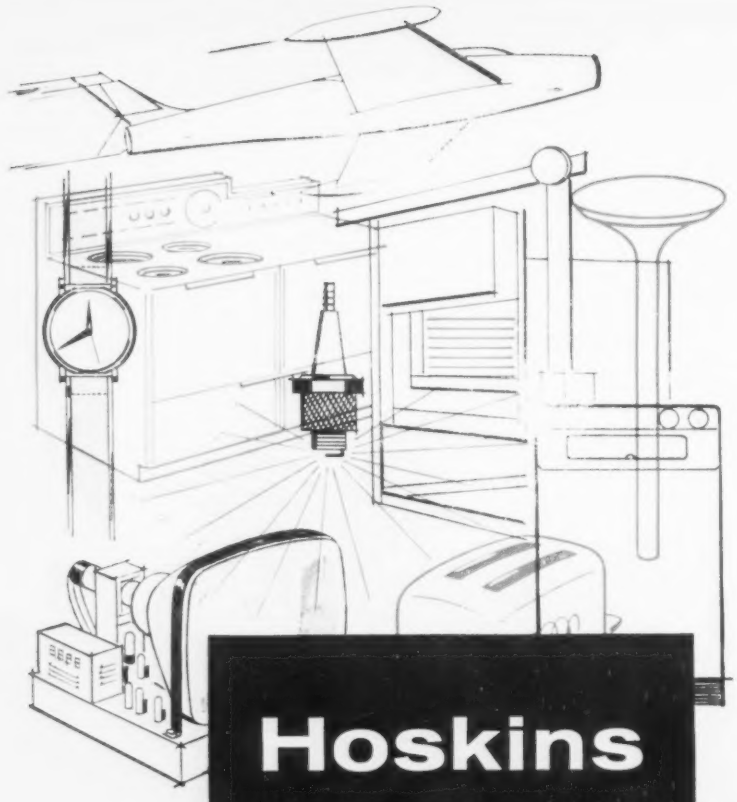
Koppers' J. F. Haley

How To Keep Traffic Costs In Line P. 55

Will Users Pass On Steel Price Increases? – P. 59

For Better Coatings Get Base Metal Clean – P. 95

Digest of the Week P. 2-3



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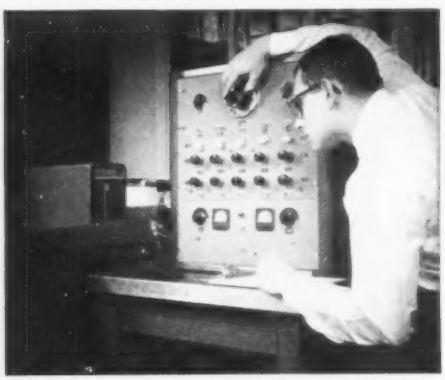

Only one of its kind— Designed and built by Hoskins, this special instrument provides accurate means of measuring temperature coefficient of resistivity of wire and ribbon. As part of our complete metallurgical research and development facilities, it is one more reason why you should "look to Hoskins first for the finest in quality controlled alloys!"

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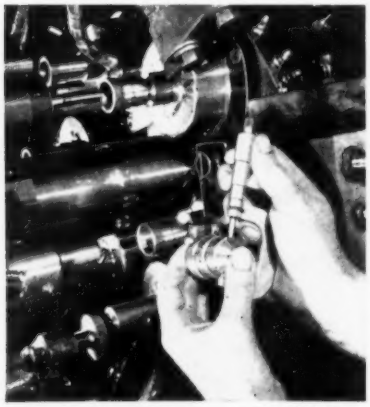

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The IRON AGE

July 11, 1957—Vol. 180, No. 2

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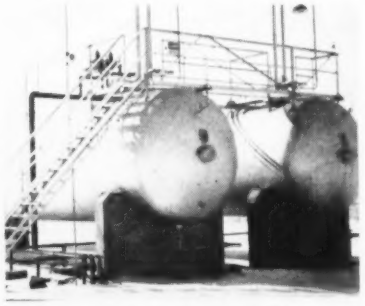
NEWS ARTICLES

LAYAWAY PROGRAM

Stores Tools Safely—For nearly four years the Ordnance Corps has been testing machine tool preserving techniques on a mass scale. It has come up with what it believes to be the safest, most economical way to do the job. P. 60

TANK MAKERS

Sad but Hopeful—There should be a big demand for tanks for the fast growing liquefied petroleum



gas market. It isn't working out that way. Tank makers hope for better things if a few obstacles can be licked. P. 62

ZINC AND LEAD

Will Go It Alone — Various government agencies are trying to help domestic producers. But none will make it this year. Congress is tied up by logjam of bills. CCC position is untenable on barter, but no change expected for awhile. GSA buying not enough. P. 64

AUTO GAS TURBINES

Effort Stepped-Up— A small firm, Misco Precision Casting Co.,

Metalworking

TRAFFIC SENSE: Wide awake companies are saving money today through a unified approach to traffic handling. Tieing in purchasing, production and distribution decisions with the too-often-neglected traffic department makes good sense. P. 55

has been given the big job of finding a low-cost method for producing turbine wheel assemblies for Ford Motor Co. Its goal, an assembly costing $20-$25. P. 72

INDUSTRIAL TRUCKS

More Competitive—There is a short waiting line for most models, and you'll pay more. But the field is getting so competitive that makers are really striving to put out a better machine. In 1957 you'll have more and better models to choose from. P. 152

FEATURE ARTICLES

COATINGS THAT LAST

Clean Base Needed—A freshly applied lining inside a steel tank or length of pipe usually looks good. But will it last under critical conditions? Your money's worth in a lining depends on proper preparation of the base metal. P. 95

HONEYCOMB PANELS

Of Stainless Steel — As speeds and operating temperatures increase in supersonic fight, design engineers find better materials. Armco 17-7 PH, a stainless steel alloy, is proving its ability to stand the rigid conditions in honeycomb sandwich. Brazing technique looks best for fabricating. P. 99

CORE MOLDING

How Spray Improves — Production of cast iron pipe depends on individual operations, such as making core molds. Here's a way to increase output and quality by setting up an automatic spray booth for coating the molds. P. 102

SIMPLIFIED DRAFTING

A Reappraisal—Simplified drawings can save time and money. But—will wholesale application of the technique result in overall savings? The answer is in the middle road between elaboration and simplification. P. 104

NEW FURNACES

Treat Giant Sizes — The Air Force has gone in for large forgings and extrusions in aircraft construction. The increase in size of forging and extrusion presses has resulted in building of new furnaces to process the giant pieces. P. 106

MARKETS & PRICES

HIGHER WAGES

All Industry Affected—Steel price increases will force most metalworking companies to boost their prices. Wage increases in their own back yards compound the price problem this year. P. 59

ADHESIVES

Aiming at Metalworking — It may take some time, but adhesives are making progress in the metal-to-metal field. Problems of meeting automation manufacturing speeds will be tough to solve. P. 63

WEST COAST SHIPYARDS

Signs of Life — The Navy's spread-the-work policy is beginning to revive Farwest shipbuilding activity. Some tanker construction is expected. But the yards have a tough problem—cutting costs. And they have to rebuild their labor forces. P. 78

FRENCH TOOL MARKET

Nation Encourages Builders—To expand industry according to plans, the French government waives taxes on new investments in machine tools, allows accelerated amortization, grants credit at 4 pct interest, and much more. P. 80

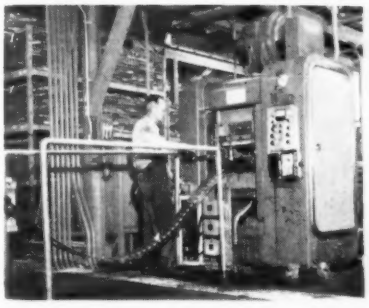
STEEL OUTPUT

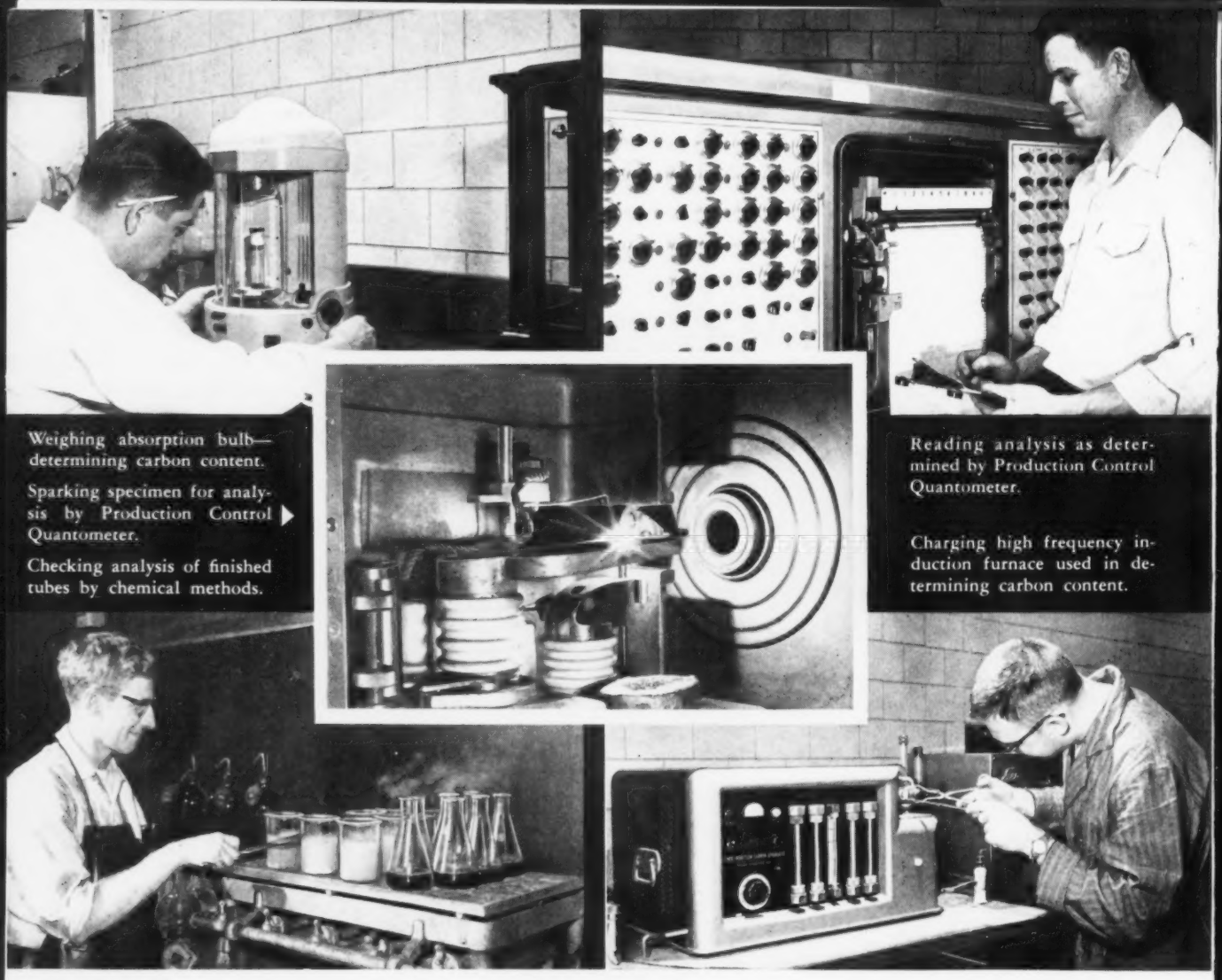
Ingot Rate Up—Steel mills are boosting operations after holiday low. Year's output could exceed 1956, threaten record 1955. P. 151

NEXT WEEK

FLYING PRESS

Advance In Stamping — This first account will show the outstanding features of a new stamping press operating on the fly. The press combines with tube making, welding, and a flying cutoff to make up a continuous line.





Weighing absorption bulb—determining carbon content.

Sparking specimen for analysis by Production Control Quantometer. ▶

Checking analysis of finished tubes by chemical methods.

Reading analysis as determined by Production Control Quantometer.

Charging high frequency induction furnace used in determining carbon content.

THE O.K. YOU DO NOT SEE IS YOUR GUARANTEE

The key to the physical and mechanical characteristics of any steel lies in its analysis. Tensile strength, corrosion resistance, resistance to "creep" at elevated temperatures, reaction to heat treatment—to name a few—are largely determined by composition.

Through B&W's analytical laboratories pass the tubing destined for practically every known type of pressure or mechanical application—hundreds of different steels—each with its own particular characteristics—and checked by technicians who know their job and using the most advanced laboratory equipment available anywhere.

Modern control methods, plus years of experience help to make the B&W laboratory "O.K." the invisible hallmark of tubing quality—and is your assurance of ease of fabrication and good service. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

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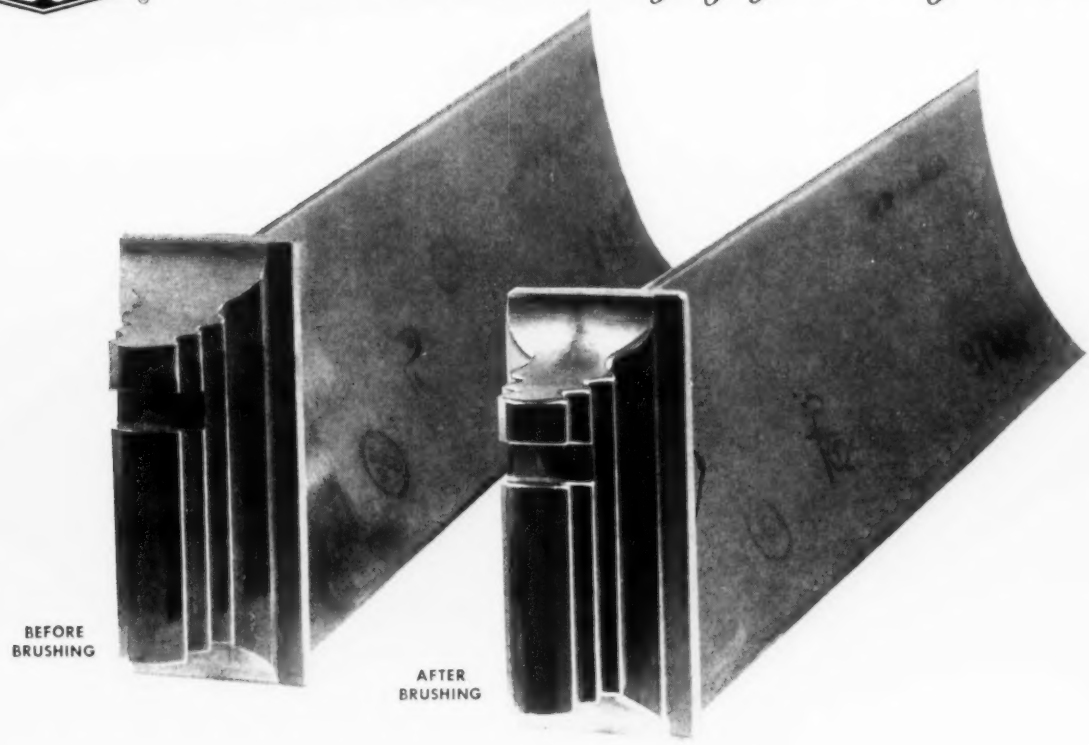


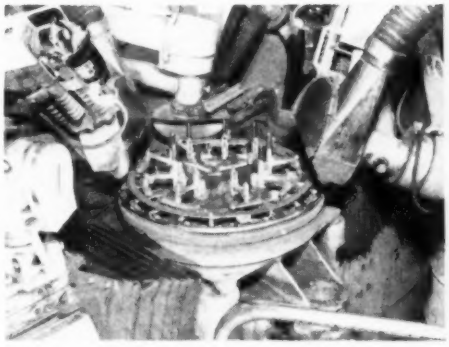
Root of a Production Problem

. . . solved with Osborn Power Brushing

YOU'RE looking at the root end of a turbine blade for jets . . . one of hundreds that go into every engine. Size and surface finish of the root must be held to exacting precision for perfect assembly and highest ultimate strength. Yet production costs must be down to earth.

Utilizing Osborn's power brushing method, jet blades are held in a fixture and traversed past Osborn Fascut® Brushes. In one simple operation, all minute burrs on the root end are removed, surface junctures are blended eliminating sharp corners where stress concentrations might occur. Results are uniform, dependable . . . at a high rate of production. The operator has only to load and remove parts.

An **O**sborn **B**rushing **A**nalysis will show you how Osborn Power Brushing can simplify your metal-finishing operations. Write *The Osborn Manufacturing Company, Dept. FF-57, Cleveland 14, Ohio*



Osborn Brushamatic® 51-3L with three brushing heads finishing root ends of jet blades.

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BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES • BRUSHING MACHINES • FOUNDRY PRODUCTION MACHINERY

What's New

IN STOCKS AND SERVICES FROM RYERSON

Recent developments of interest to men concerned with cost-cutting opportunities, sources of supply and availability of steel, aluminum, plastics and metal-working machinery.

STRUCTURALS—Greatly improved structural stocks after many months of short supply is the biggest news at Ryerson plants. Even many of the heavier sections for which demand is strongest are now available for immediate shipment.

PLATES—Stocks of heavy carbon steel plates are now much improved—and light plates continue in excellent supply. Moreover, these plates are produced to a new specification with more closely controlled chemical analysis resulting in better forming, welding and machining qualities.

HOT ROLLED CARBON STEEL BARS, including bar-size (light-structural) shapes—Huge Ryerson stocks of practically every size and shape now ensure immediate shipment of your company's requirements. Angles, channels and tees in bar sizes (below 3") are in equally good supply.

PRE-PAINTED SHEETS AND STRIP—To save you costly finishing operations Ryerson can now furnish steel sheets or slit coils pre-finished with durable baked enamel. Steel can be finished one side or two, in any plain color or in your choice of several patterns—and users report that the painted finish stands up under cutting and forming operations without cracking or peeling. Unusually large sheet and coil stocks plus unequalled processing facilities round out Ryerson sheet and strip service.

NEW ALLOY PLATE STOCKS—Due in July, midwestern stocks of A8620 plate steel in 1/2" to 6" thicknesses. This case hardening steel, ideal for rings, discs, gears, etc., can be furnished in flats or flame-cut blanks. These stocks supplement eastern stocks of E8615 plates. Also coming this summer: Eastern stocks of 4140 alloy plate.

STAINLESS, CARBON STEEL TUBING AND COLD FINISHED BARS—All types and sizes available in the nation's largest stocks—including nickel-bearing stainless, supply of which was, until recently, affected by nickel shortage.

ALUMINUM FOR ARCHITECTURAL USE NEWLY AVAILABLE—Ryerson plants supplying aluminum can now furnish Type 5005 in sheets and coils. This type is especially suitable for architectural use because it closely matches the finish of architectural aluminum extrusions—and it takes clear or color anodizing very satisfactorily.

PVC PLASTIC PIPE IN LARGE DIAMETERS—8'' and 10'' pipe in both schedule 40 and 80 have been added to growing Ryerson stocks of the remarkably anti-corrosive plastic—Ryertex-Omicron polyvinyl chloride. Valves and fittings of PVC for these big sizes also available.

QUICK MACHINERY DELIVERIES FROM STOCK—Machinery demand continues strong but improved production facilities have resulted in quicker deliveries of many types of metal-fabricating machinery available from Ryerson. This is true of equipment produced by Kling, Dreis & Krump, Bertsch, Wysong & Miles and several others. Some of the more popular models are even available from stock.

JOSEPH T. RYERSON & SON, INC. PLANTS: NEW YORK • BOSTON • WALLINGFORD, CONN. PHILADELPHIA • CHARLOTTE • CINCINNATI • CLEVELAND • DETROIT • PITTSBURGH • BUFFALO CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Steel Price Hassle— Everyone Is In The Act

This piece might seem dull to you. But the steel price increase can't be dismissed with vituperation. There is more to it than that.

Anyone with an ounce of common sense knows that higher costs require higher prices. Machines and productivity often cancel out part of the increased cost; but hardly all.

There was a time when the steel industry was on the verge of being "sick." Sick, that is, where earnings were concerned. The "prince and pauper" label was not dreamed up. It was a fact.

Today the steel industry is healthy. In spite of higher and higher wage costs, most companies have been able to make their stock attractive to investors. But if steel firms had not raised prices to take care of part of the increased wages, the industry might have been in a mess today.

Union statements that U. S. Steel Corp. could raise wages without a price increase and still make a good profit are so much hogwash. They hardly deserve a rebuttal.

But here is one good rebuttal: If U. S. Steel hadn't shown some common sense in its pricing policies there would not be enough money in the till to make Dave McDonald's boys among the best paid in the world.

Politicians, union fellows and viewers-with-alarm start off on the premise that steel firms want to gouge their customers. That's so much bilge.

The contract which Dave McDonald—and some back-room Administration strategy—forced upon the steel industry is responsible for last week's price increases; it will be responsible for next year's increases too.

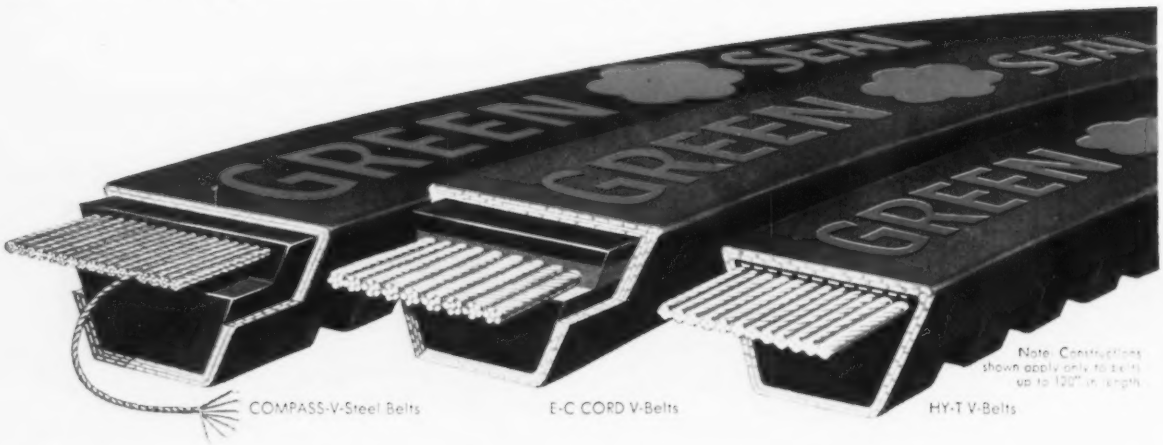
U. S. Steel is a good target for men who are up for election—or re-election. It is also a butt for steel firms who feel that prices should be even higher. It makes a good target too for Dave McDonald who, unlike his predecessor, the late Phil Murray, wants to get into the national wage-price inflation act.

The hard fact is that there will be price increases as long as wage demands are out of line with productivity and the state of the economy. Steel people and others don't want higher prices. But if they are forced into wage booby traps, then to stay alive they have to get part of their relief from higher prices.

Tom Campbell

Editor-in-Chief

Now—V-Belts with the Green Seal solve the major multiple drive problem



The Green Seal stands for true dimensional stability in V-belts. And with Green Seal dimensionally stable belts you can be sure that matched sets are truly matched and will stay matched—that mismatching (the biggest problem in belting multiple drives successfully) is a thing of the past.

The key to dimensional stability lies in the tension members of the belt. For many years, steel cables as developed by Goodyear were the only length stable load carriers, but now they have been joined by synthetic cords, thanks to the amazing Triple-Tempered 3-T process.

The 3-T process is an exclusive method of tempering the cord with Tension, Temperature and Time for maximum strength and minimum change in dimensions. This assures no change in length during storage plus greatly increased shock- and stretch-resistance on the drive.

The end result is smoother, longer-running teams of belts that give you maximum, trouble-free, horsepower hours at minimum cost. What better reason for specifying V-belts with the Green Seal?

DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER

The Goodyear Tire & Rubber Company, Industrial Products Division, Dept. 794, Akron 16, Ohio

Please send me more information about how V-Belts with the Green Seal solve the major problem in belting multiple V-belt drives.

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Company_____

Street Address_____

City_____ Zone_____ State_____

Compass, E-C Cord, Hy-T, Green Seal—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

The Dangerous Age

Sir—I read with great interest your editorial "The Dangerous Age: We Are Deep In It Now" in your June 13 issue. It happens that I read a number of others on the same subject and think that yours is far and away the best.—A. J. Murray, A. B. Murray Co., Inc., Elizabeth, N. J.

Depreciation

Sir — I would very much like two copies of the reprint of the article by Mr. Barlow entitled "Let's Make Sense In Our Depreciation Policies."

I believe this article is excellent and deserves wide circulation.—S. F. Kosters, Vice Pres., Stone & Webster Engineering Corp., Boston, Mass.

Sir — I would appreciate your mailing to my residence five reprints of Mr. Joel Barlow's article entitled "Let's Make Sense In Our Depreciation Policies," in your June 6 issue.

It is the finest presentation on depreciation that I have ever seen.—A. Minetti, Consultant, Metalworking Equipment Div., BDSA.

Ultrasonics

Sir—It is to be presumed that a tabulation of equipment manufacturers published should be reasonably complete and accurate. The ultrasonic equipment list p. 84 of the June 13 IRON AGE issue leaves a lot to be desired. For example both Tocco and Bendix probably have more machines and kilowatts than everyone else put together.—H. B. Osborn, Jr., District Mgr., The Ohio Crankshaft Co., Cleveland, Ohio.

▪ We're sorry our list of ultrasonic equipment makers did not include Tocco and Bendix. Your justified complaint points up the danger of using a partial list of manufacturers in any industry.—Ed.

Cut Guesswork

Sir—I have just completed reading your article "How to Cut Inventory Guesswork" in your May 9 issue, and it gives me pleasure to report that I found it very constructive and informative.

I would appreciate receiving six copies at your earliest convenience.—H. D. Jackson, Dept. 398, Northern Electric Co., Montreal.

▪ Copies are on the way.—Ed

Cyclosteel

Sir—I would appreciate it if you would send me six reprints of the article entitled "Cyclosteel: Steel Direct From Ore" which appeared in the May 23 issue.—J. P. Long, Treasurer, The Cleveland - Cliffs Iron Co., Cleveland, Ohio.

Microflat Equipment

Sir—We would like to thank you for the fine article, "Fast Honing Cycles Produce Flat, Parallel Surfaces" in the May 23 issue of THE IRON AGE.

It tells the complete story concisely and factually.

We are ordering reprints for use by our salesmen.—M. P. Ellis, Director of Advertising and Sales Promotion, Micromatic Hone Corp., Detroit, Mich.

"But you know I don't drink coffee . . ."

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PROMPT DELIVERY

DIAMOND Ornamental PERFORATED METAL

Grecian Cane Design — 42% Open Area

Side Stagger Design — 40% Open Area

Tile Cane Design — 52% Open Area

Need Holes in Metal Sheets?

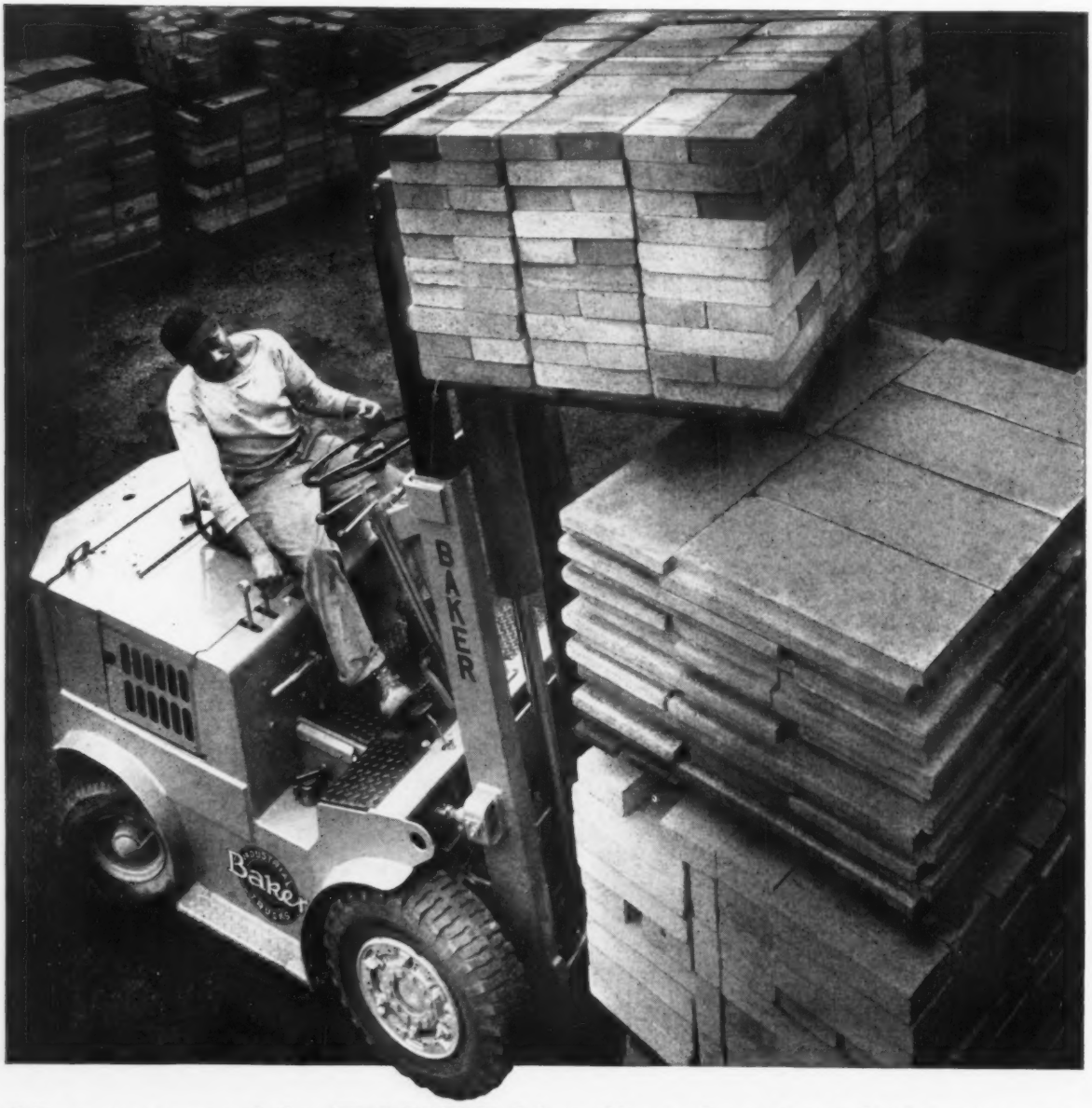
Several considerations must usually be observed. The design should be attractive in appearance, with adequate open area, while still, for some purposes, affording suitable concealment of what lies behind or underneath.

WHEREVER perforated metal is required, and it has thousands of applications today, you'll do well to contact DIAMOND. Forty years of widely diversified experience and hundreds of modern tool arrangements, enable us to give unsurpassed quality and delivery at competitive prices.

Catalog 39 shows many interesting applications and contains complete illustrated working data. No charge or obligation, but kindly state business connection.

DIAMOND MANUFACTURING CO.
WYOMING WILKES-BARRE AREA PENNA.

West Coast Plant, Diamond Perforated Metals Co
17915 So. Figueroa St., Gardena, California
Los Angeles Area



Maneuverable BAKER Yardloader truck features 48-inch wheelbase with minimum overhang!

This Baker pneumatic-tired gas fork truck has many outstanding features for more efficient, more dependable yard handling –

It is **FAST** – Top speed with load 8.6 mph.

- **COMPACT** – Only 48-inch wheelbase and almost no overhang.
- **MANEUVERABLE** – Turning radius only 79 inches.
- **STURDY** – Welded box-type frame construction. Heavy-duty industrial gas engine. Rugged Timken industrial truck drive axle. Heavy-duty transmission. Rubber mounted trail axle, fully compensating.

It is **SAFE** – Low Center of gravity for stability. Large self-energizing hydraulic brakes. Independent 2-shoe parking brake.

- **EASY TO OPERATE** – Effortless power steering. Convenient, easily manipulated lift and tilt controls. Padded driver seat – offset for better visibility. Unobstructed access for mounting from either side.

Model illustrated is Baker FGF-40 (4,000 lbs. capacity) with truck-loading mast providing 110-inch lift from 71-inch overall height. Standard model has full 130-inch lift. Single or dual drive wheels available. Other YARDLOADERS in capacities from 2,000 to 7,000 pounds. Write for complete information.

Baker®
industrial trucks

THE BAKER-RAULANG COMPANY
1227 WEST 80th STREET • CLEVELAND 2, OHIO
A Subsidiary of Otis Elevator Company

Inside Stuff

If you store a corrosive gas or liquid in a metal tank, or move it through metal pipe, you need a protective lining of some sort. The type of lining you specify is important, of course. But how long it lasts depends primarily on one thing: how well you prepare the metal surface underneath.

First of all, the base metal must be smooth. That's so the lining will be the right thickness throughout. Second, the base metal must be almost hygienically clean; too many linings fail from the wrong side because of things like underfilm corrosion. Third, the base metal must be abraded or etched to grip the lining tightly.

Meeting these three requirements isn't too difficult, if you know what to do—and what to avoid. You'll find a wealth of practical advice in the article beginning on page 95.

Highball!

Most of us think of traffic in terms of the exploits of Casey Jones. But there's more than romantics connected with the business of getting raw materials or p r o d u c t s moved from one place to another.

There's also the matter of dollars and cents. Traffic, it seems, is tied in with sales and production, believe it or not. The production man may want to look the other way, but there's an area in traffic planning that may interest him, too.

That's why we came up with the idea for the traffic story beginning on page 55 of this week's issue. There's plenty of meat in it for top management, for sales, and for production to think about. Years ago this might have been heresy, but times have changed.

As George McManus, our alert Pittsburgh editor, points out, the "unified" approach to traffic is the thing these days. Alert top management is no longer interested in isolated savings trafficwise. It approaches the problem from the "big picture" angle.

It's an old story. Modern management has learned that there are many areas for cost savings that years ago failed to ring a bell. But, as Mr. McManus points out, the dollars saved in traffic planning count as much as those saved in sales or production.

For that reason alone, our piece on traffic is well worth the reading. After all, outfits like Westinghouse Electric and Koppers have found that it pays off.

Puzzlers

A mother worm, a father worm and a baby worm lived happily in a hole in a verdant field. One day a neighbor told them that he had overheard the farmer say that he was going to plough up the field the following day. In great consternation the worm family packed and moved over the wall into the next field, where they dug themselves a hole and went snugly to sleep.

The next morning, as is the habit among worms as well as mortals, the baby worm got up first, crawled out of the hole, looked around and saw that their old field was really ploughed up. He said with great enthusiasm and relief, "Gee, I'm glad we moved over here, all five of us."

How come he said "all five of us"?

New Puzzler

Mr. L. D. Snyder, The Littlestown Hardware & Foundry Co., Littlestown, Pa., an old Iron Age friend for 40 years, submits this one:

On a golf course there are two caddies. The little caddy is the brother of the big caddy but the big caddy isn't the brother of the little caddy. What is their relationship?

YOUR ORDER FOR

POUND... OR

will be consistently uniform in dimensions and engineering properties if it's - - -

PENNROLD
precision strip

Beryllium Copper
Phosphor Bronze
Nickel Silver
Brass
Chromium Copper
Stainless
(incl. 17-7 P H)
Invar
Nickel Iron Alloys

0.0005 in. to 0.040 in. thick
0.090 in. to 6 in. wide

Some immediately available. Others rolled to order in 2 to 21 days. Can be supplied in coils or straight lengths with slit or filed edges — also cadmium plated.

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PRECISION PRODUCTS, INC.
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F. G. STROKE
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J. A. CROWE

Cleveland
L. D. ALSPACH

Los Angeles
KRUSEN WIRE & STEEL CO.

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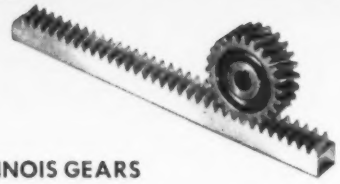
Franklin Park, Illinois

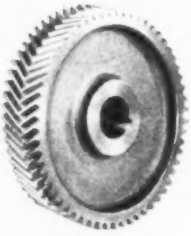
Los Angeles
KRUSEN WIRE & STEEL CO.

Wherever Power is on the move...



INDUSTRY DEPENDS ON ILLINOIS GEAR

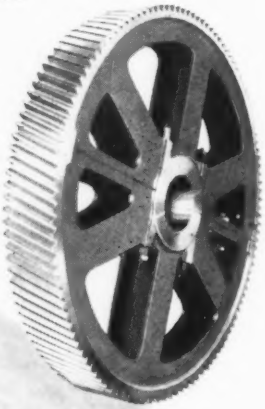
Throughout the world . . . wherever power is on the move . . . ILLINOIS GEARS are *delivering this power* dependably year in and year out.

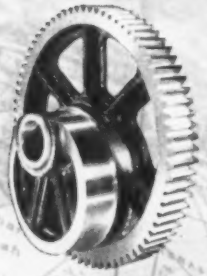


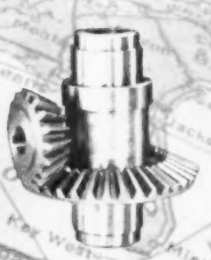
Whether it is in machine tools, steel mills, cement mills, paper mills, chemical plants, construction equipment . . . machinery of any kind . . . this dependability, proven by performance, means true economy that has resulted in enduring customer satisfaction.

When you need gears—remember this: ILLINOIS GEAR manufactures *the most complete line of quality gears in the world.*

You can specify and buy ILLINOIS GEARS *with confidence and assurance* that they will more than satisfy your most exacting requirements.







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ILLINOIS GEARS
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Gears for Every Purpose ... one gear or 10,000 or more

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EXHIBITS, MEETINGS

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22.)

Metal Show—Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

JULY

Truck-Trailer Manufacturers Assn.—Summer meeting, July 16-17, Homestead, Hot Springs, Va. Society headquarters, 710 Albee Bldg., Washington 5, D. C.

National Tool & Die Manufacturers Assn.—Summer meeting, July 24-27, Grove Park Inn, Asheville, N. C. Society headquarters, 907 Public Square Bldg., Cleveland.

AUGUST

Society of Automotive Engineers—West Coast meeting, Aug. 12-15, Olympic Hotel, Seattle. Society headquarters, 485 Lexington Ave., New York.

American Institute of Electrical Engineers—Pacific general meeting, Aug. 28-30, Chinook Hotel, Yakima, Wash. Society headquarters, 33 W. 39th St., New York.

SEPTEMBER

American Mining Congress—Metal mining and industrial minerals convention, Sept. 9-11, Hotels Utah & Newhouse, Salt Lake City, Utah. Society headquarters, 1200 18th St., Washington, D. C.

Instrument Society of America—12th annual instrument-automation conference and exhibit, Sept. 9-13, Cleveland Auditorium, Cleveland. Society headquarters, 313 Sixth Ave., Pittsburgh.

National Petroleum Assn.—Annual meeting, Sept. 11-13, Traymore Hotel, Atlantic City. Society headquarters, 958 Munsey Bldg., Washington.

Marking Device Assn.—National meeting, Sept. 19-20, Roosevelt

(Continued on P. 16)

How DOUGLAS

saved 25,000 manhours!

With SPEED-D-BURR PRECISION BARREL FINISHING*

An Incredible $140,000.00 in Dollar Savings!

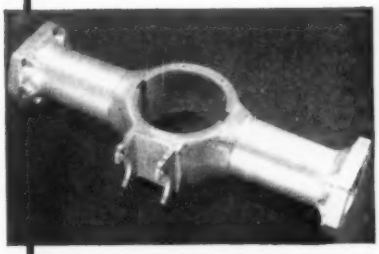
Time consuming handwork, production delays, difficulty in controlling uniformity and high costs in deburring a wide variety of parts in short runs was a problem faced by Douglas Aircraft. Turning to precision barrel finishing as a possible solution, a survey of various types of equipment and sample lot testing of many parts followed. SPEED-D-BURR engineers recommended a 4 unit installation to begin production *(picture above)*. Within a few weeks, savings began to mount, parts were being turned out faster than ever before and close tolerance finish quality was greatly improved on widely diversified parts from a 30" long casting to small washers – all in the same SPEED-D-BURR installation. Time study records indicated that projected manhour savings would reach 25,000 for the year with a dollar savings of $140,000.00 *(more than 10 times the equipment cost)*.

Like to read the whole story? Ask for Speed-D-Burr Folder DA-1...

ALSO WRITE FOR CATALOGS:

- *How to Cut Production Costs 80% or More*
- *The Futurama Series*
- *The Mity-Mite Series*
- *Media and Compounds*
- *Hot Sawdust Barrels*
- *Handling and Separating Equip.*

*As told in Iron Age Magazine — August 2, 1956



ONE SAVINGS EXAMPLE

Part No. 5638557-3

Hand Deburr . . .	$11.25 each
Speed-D-Burr . . .	.50 each
SAVINGS	$10.75 each

This is just one of many parts on which exceptional savings were made using SPEED-D-BURR Precision Barrel Finishing.

Service Is Our Most Important Product... It Does Not Cost... IT PAYS!

SPEED-D-BURR CORPORATION PRECISION BARREL FINISHING DESIGNERS • ENGINEERS MANUFACTURERS

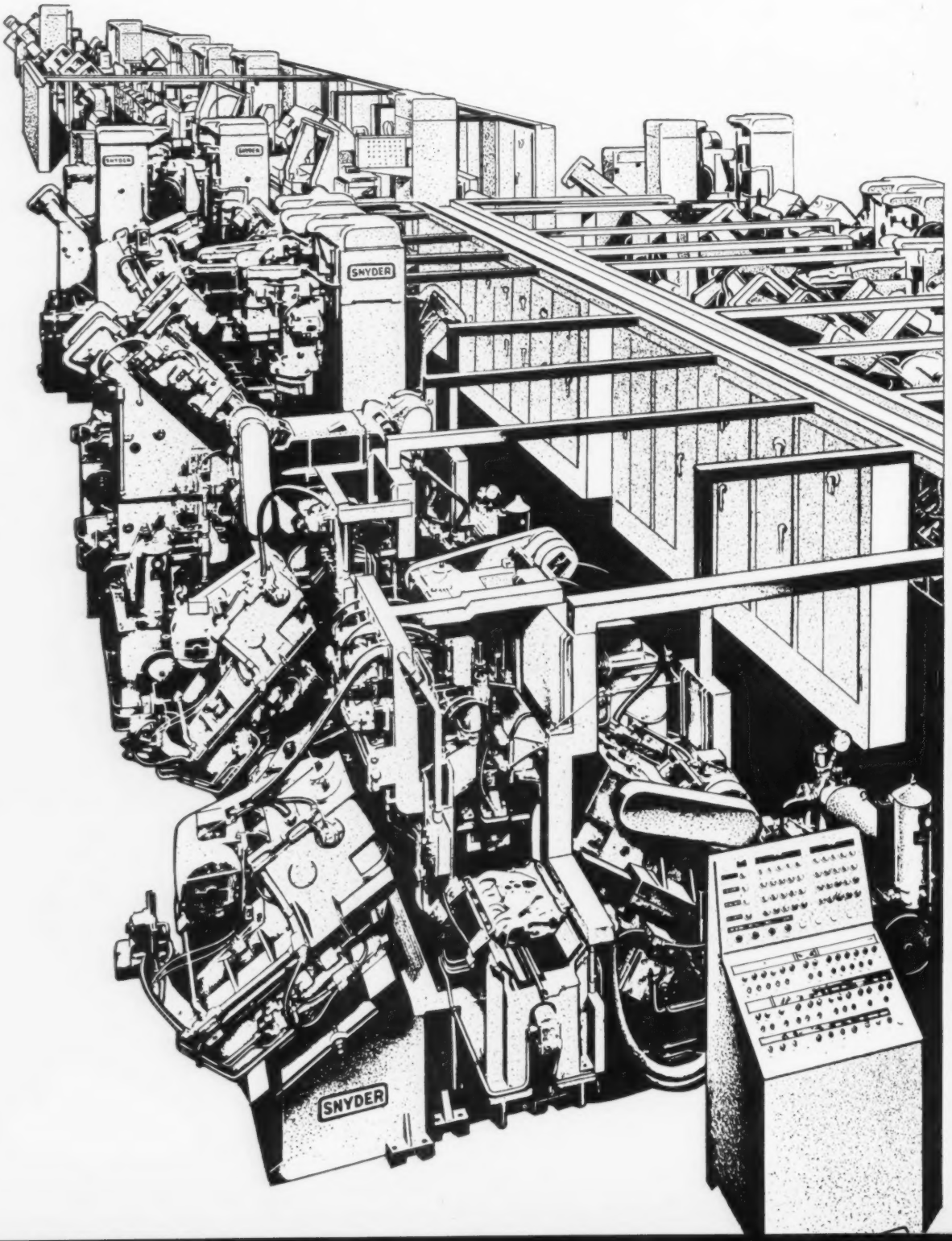
THE WORLD'S MOST COMPLETE LINE OF PRECISION BARREL FINISHING EQUIPMENT & SUPPLIES

SPEED-D-BURR CORPORATION

3613 SAN FERNANDO RD., GLENDALE 4, CALIF.

Distributorships available in some key areas . . . to complete our national sales network.

Unique Combination of Snyder Special Two or Four Barrel Intake Manifold

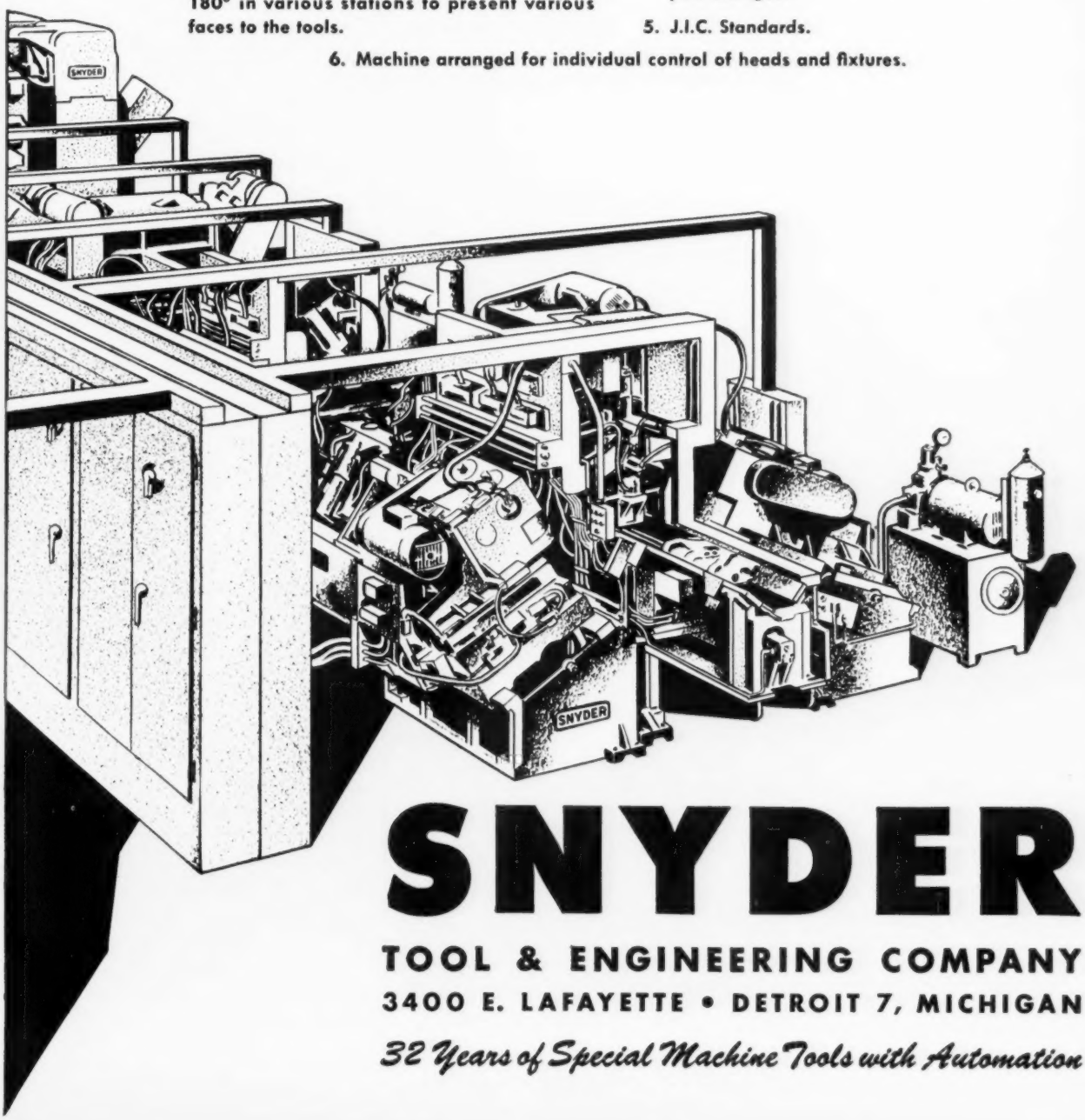


Transfer Machines Processes Either Castings from Rough to Finished Parts

Combination of two special transfer milling machines in parallel, with automation, feeding into one special transfer drilling machine gives production of 136 pieces per hour

Special Features of Snyder Machines Nos. 55-60 and 55-61

1. Machine line handles two or four barrel manifolds, random intermixed; sensing devices automatically instruct the proper drilling and tapping units.
2. Part rotated vertically 180° and horizontally 180° in various stations to present various faces to the tools.
3. Individual electrical panels and hydraulic units for each segment.
4. Wing bases, sections, spacers and risers standard throughout for easy adaptation to future part changes.
5. J.I.C. Standards.
6. Machine arranged for individual control of heads and fixtures.



SNYDER

TOOL & ENGINEERING COMPANY

3400 E. LAFAYETTE • DETROIT 7, MICHIGAN

32 Years of Special Machine Tools with Automation

precision
stands
alone...

"Fischer Turned"
ALUMINUM NUTS

Fischer precision-turned aluminum nuts set new standards of uniformity and accuracy that speed assembly operations . . . reduce costs.

Standard types and sizes or "specials", you pay no premium for this extra quality . . . Fischer turned aluminum nuts cost no more than those produced by other, less exact methods.

Write today for Catalog No. 55

C-308-FS

Fischer SPECIAL MFG. CO.

445 MORGAN ST. • CINCINNATI 6, OHIO

EXHIBITS, MEETINGS

Continued from P. 13

Hotel, New Orleans. Society headquarters, 912 Chicago Ave., Evanston, Ill.

Steel Founders' Society of America—Fall meeting, Sept. 23-24, The Homestead, Hot Springs, Va. Society headquarters, 606 Terminal Tower, Cleveland.

The American Society of Mechanical Engineers—Fall meeting, Sept. 23-25, Statler Hotel, Hartford, Conn. Society headquarters, 1010 Empire Bldg., Pittsburgh.

Standards Engineers Society—Sixth annual meeting on standardization — economy through application Sept. 23-25, Hotel Commodore, New York. Society headquarters, P. O. Box 281, Camden, N. J.

Assn. of Iron & Steel Engineers—Annual convention, Sept. 23-26, Penn Sheraton Hotel, Pittsburgh. Society headquarters, 1010 Empire Bldg., Pittsburgh.

American Hot Dip Galvanizers Assn.—Semi-annual meeting, Sept. 26-27, Netherland-Hilton Hotel, Cincinnati. Society headquarters, 1806 First National Bank Bldg., Pittsburgh.

OCTOBER

The Electrochemical Society—Semi-annual meeting, Oct. 6-10, Statler Hotel, Buffalo. Society headquarters, 216 W. 102nd St., New York.

American Institute of Steel Construction — 35th annual meeting, Oct. 6-11, Hotel del Coronado, Calif. Society headquarters, 101 Park Ave., New York.

American Society of Lubrication Engineers—Fourth conference, Oct. 7-9, Royal York Hotel, Toronto, Ont., Canada. Society headquarters, 84 E. Randolph St., Chicago.

Committee on Vacuum Techniques—Fourth annual symposium on high vacuum technology, Oct. 9-11, Hotel Somerset, Boston. Society headquarters, Box 1282, Boston.

no chipping - no rusting
no pitting - no peeling

no work-no worry

with ever-bright brightwork of

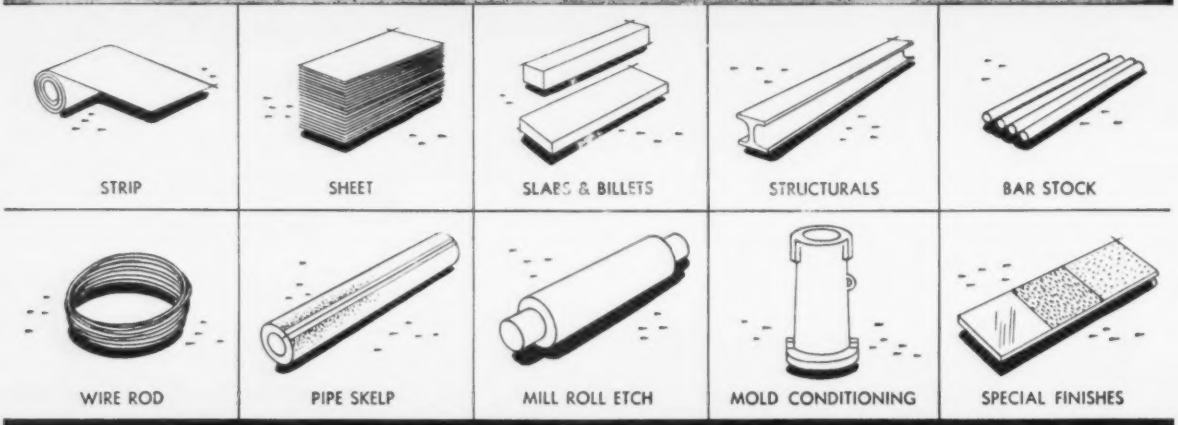
Superior stainless steel

Let it rain, mist or dew . . . for the lifetime of the car, stainless steel brightwork never needs care. Exposure to the elements can't harm it. You don't lift a finger or pay a penny to keep the showroom shine of *stainless*. ● Strong, hard, ever-bright stainless steel will serve you best on your new car, and protect top value when you sell. *And the chances are, it'll be* SUPERIOR.

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

WHEELABRATOR®
mechanical descaling

SAVES LABOR, SPACE, MONEY AND METAL WHEREVER IT'S USED ON STEEL!



HOW WHEELABRATOR SAVES

- Replaces or reduces acid pickling
- Saves acid, acid disposal
- Removes only scale – no metal
- Reduces manhour needs
- Requires only ⅓ to ½ the floor space
- Gives improved surface for cold working and cold forming
- Reduces need for scale breaking

Wheelabrator mechanical descaling has proved it can remove scale from steel, using little or no acid, and do it faster at less cost than is possible with acid pickling. Over 90 installations have demonstrated this process is cheaper, more efficient and provides a clean material that produces an improved end product. Wheelabrator descaling itself uses no acids or pickle liquors. It removes scale with an abrasive blast from one or more rotating wheels. Each wheel hurls abrasive in a fan-shaped blast pattern against the surface of the material being cleaned. It covers the entire surface (or any portion of it desired) in such a way that it is uniformly blasted to remove scale at a constant rate. This rate can be controlled to suit the requirements of the job.

In many cases, no further cleaning is required and acid pickling is completely eliminated—particularly where the end product does not require cold reduction. This means complete elimination of acid costs, acid disposal problems, virgin metal loss and other inherent disadvantages of acid pickling. Mechanical descaling is adaptable to virtually any speed of production and requires only 1/3 to 1/2 the space needed for acid pickling. The flexibility of mechanical descaling permits its easy integration into lines already in existence and facilitates design and planning of new installations.

For more information on Wheelabrator for principles and savings, write today for your free copy of Catalog 74-C.

WHEELABRATOR
CORPORATION
510 South Byrkit Street Mishawaka, Indiana

AT YOUR SERVICE

The strategic location of our manufacturing facilities, sales offices and warehouses, assures efficient handling of your ferro-alloy needs.

PLANTS: Philo, Ohio; Brilliant, Ohio and Tacoma, Washington. SALES OFFICES: Birmingham, Chicago, Detroit, Los Angeles, Philadelphia, Pittsburgh, San Francisco, Seattle. WAREHOUSES: Denver, Los Angeles, Minneapolis, Oakland, Salt Lake City, Mexico City and Vancouver, B. C., Canada. *We invite your inquiry.*

Ohio Ferro-Alloys Corporation
Canton, Ohio

Loef Co. "From-Scale-to-Bale" Efficiency features 7-hour, 95,000 lb. production of Dempster-Balester!

1. Load of scrap is weighed-in . . .

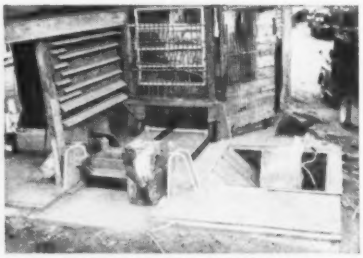
2. . . . by Mr. R. L. Blumberg.

3. Crane takes scrap from truck . . .

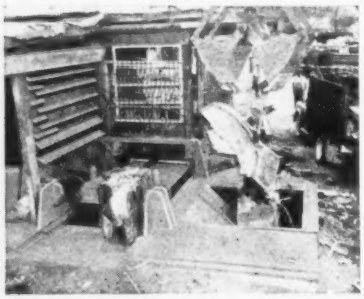
4. . . . to Dempster-Balester's Skip Pan.

5. Auxiliary-Compression Door CRUSHES . . .

6. . . . preceding charge into charging box.



7. Charging Box Door closes; scrap is baled.



8. Then bale is ejected—a 1-2-3 operation. 1. Skip Pan LOADS Charging Box. 2. Auxiliary-Compression Door CRUSHES scrap metal deep into box. Charging Box Door closes and charge is baled while Skip Pan is re-loaded. 3. Then, bale is EJECTED and Skip Pan dumps another load into charging box — a fast, continuous and efficient baling cycle that permits you to produce compact, high density bales, one-after-another!

Note how Dempster-Balester operator moves Skip-Pan Loader up to dump next charge into box and simultaneously moves Auxiliary-Compression Door down to CRUSH the scrap when it is dumped into box.

Note above that with usually one stroke the scrap is CRUSHED into charging box, ready for baling.

Business men in Athens, Ga., call The Loef Company's scrap metal collection operation a "from-scale-to-bale" production plant. It's a tribute to the efficient operation at The Loef Co., headed by Harry Loef.

Turning salvable scrap metal into segregated re-usable products calls for engineering. And hundreds of scrap metal engineers like Harry Loef and son-in-law R. L. Blumberg weigh-in scrap secured by regular collectors . . . then, minutes later, compress the loads into compact bales by efficient, fast Dempster - Balester presses!

MR. HARRY LOEF

For eight years The Loef Co. used a Dempster - Balester Model "275". This, their first press, produced on the average of 90,000 lbs. of baled scrap in 14 hours. When the operation expanded and a faster press was required, the "like new and still efficient" Model "275" was sold and Mr. Loef purchased the faster Dempster-Balester Model "700". The "700" increased production to an average of 95,000 lbs. of baled scrap in 7 hours! However, although not in an industrial area, a 109,000 lb. carload of lamination was recently purchased for a test-run through the press. The Dempster-Balester accomplished the task in 1 hour and 33 minutes. "That just gives you an idea what this Dempster-Balester can do," reported Foreman J. J. Escoe, who added: "Too, of course, much of the credit belongs to Henry Knight, our crane operator, and Mark Garing, press operator. They're good!"

Big advantages of the Dempster-Balesters, according to Mr. Loef, are minimum investment, minimum installation expense and high operating efficiency. "We just don't have any maintenance to speak of," added Mr. Escoe. "But, we clean and grease our Dempster-Balester regularly. Might add that a man couldn't ask for any better parts service. Dempster Brothers sure take care of their presses."

High tribute to us. We appreciate it. We are proud of the accomplishments of our Dempster-Balesters, and of our service staff. We believe you, too, will find your wisest and most profitable press investment will be in a Dempster-Balester! Write us today for complete information. *Manufactured by Dempster Brothers, Inc.*

DEMPSTER BALESTER®

DEMPSTER BROTHERS, 4 N. Knox, Knoxville 17, Tennessee

NOW! USS Gerrard AUTOMATIC STRAPPING MACHINE

Fully Tested, Tried and Proven

FOR ADDITIONAL INFORMATION and a copy of our folder on this Model 12 Automatic Strapping Machine, fill in the convenient coupon.

Where automation is important to your packaging and bundling problems, the USS Gerrard Model 12 Automatic Round Steel Strapping Machine is the answer to your needs. This machine has thoroughly proved its efficiency and trouble-free operation. Here, briefly, are some of its many advantages:

LOW COST—This is one of the lowest-cost automatic strapping machines on the market today.

COMPACT—Requires only 11½ sq. ft. of floor space. Table height, 31". Weight (approx.), 1500 lbs.

SPEED—Up to 24 ties per minute.

TWO SIZES—Either machine will handle packages as small as 8" wide by 2" high. The larger will handle packages as large as 26" wide by 20" high.

EASY TO OPERATE—Utilizes USS Gerrard Round Steel Strapping from 14 through 18 gauge. Easy to thread and operate.

LOW MAINTENANCE—One-shot, built-in lubrication system and compact, rugged, simple construction mean minimum service and maintenance.

TENSION—Can be predetermined, and when set is uniformly maintained on all packages regardless of size or weight.

SINGLE POWER SOURCE—All functions are mechanically controlled and interlocked. Simply plug in and run.

PACKAGES which vary in size and shape can be strapped without adjustment to machine.

COMPRESSION DEVICE for pre-compressing packages or bundles can be supplied as optional equipment.

QUIET OPERATION—Fully engineered to eliminate noise and vibration.

For more complete details, contact your USS Gerrard sales representative. Also mail coupon for folder and the Gerrard Blue Book of Packaging. This contains full information on all USS Gerrard Machines and round and flat strapping.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CHICAGO, ILLINOIS

USS GERRARD STEEL STRAPPING
Round and Flat
UNITED STATES STEEL

USE THIS COUPON

Gerrard Steel Strapping Division
United States Steel Corporation
4711 S. Richmond St., Chicago, Illinois

Please send me folder on the Automatic Strapping Machine and the 36-page GERRARD Blue Book of Packaging. No obligation.

Name _____

Company _____

Address _____

City _____ State _____

Have Salesman Call ☐

They made 1 wheel

Working closely with foreman Bill Todd (right) of Whitin Machine Works, Whitinsville, Mass., and with Bay State's sales engineering department, distributor Vic Ericson, of Johnson deVou, Worcester, Mass., has helped cut Whitin's grinding costs thousands of dollars a year.

. do the work of 12

This is the story of two stubborn men and what seemed to be an impractical idea. The idea still seems pretty amazing to many experienced grinding men . . . but time and cost sheets over a four year period *prove* that it works.

Here's the story.

The central grinding department at Whitin Machine Works has all the problems of job-shop operation. Their centerless grinders, for example, are used to finish parts that range from 1 8" to a full 5" diameter and come in bronze, brass, aluminum, cast iron, Meehanite and all types of soft and hardened steel. Runs are short; as low as three or four pieces and rarely over a couple of hundred.

To handle this tremendous variety of jobs, the shop had stocked a dozen different types of grinding wheels and foreman Bill Todd wanted to simplify. He wanted to cut the amount of valuable labor and machine time that went into wheel changes and put it into production. And, what he really hoped to get was not just a few multi-purpose wheels but *one all-purpose* wheel.

Successful in convincing Whitin's tool control engineer that it was worth the try, he called in Bay State distributor Vic Ericson. Ericson accepted the challenge and went to work with Bay State's sales engineering department. The effort paid off.

The result was a single wheel that handles all the sizes and all the metals. On regular work, finishes average around #16RMS and Bill Todd's skilled operators can get as fine as #2; a single dressing once an hour maintains normal high production rates.

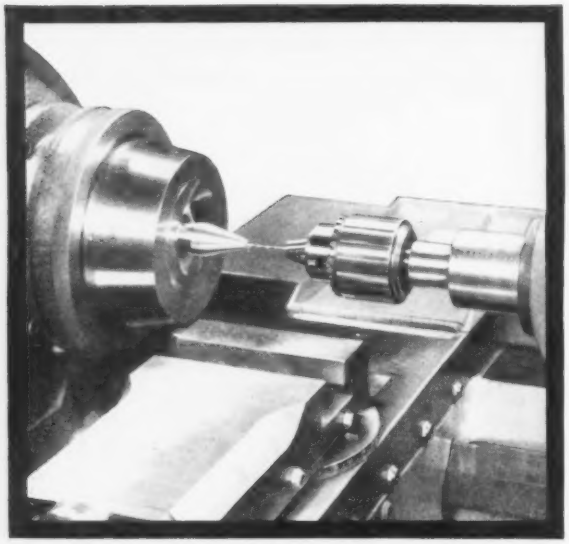
Whatever your company's abrasive problems may be, you'll find Bay State representatives ready to help and competent to work out practical solutions.

BAY STATE ABRASIVES

BAY STATE WHEELS of PROGRESS

Bay State Abrasive Products Co., Westboro, Massachusetts.
Branch Offices and Warehouses: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh.
Distributors: All principal cities. Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ontario.

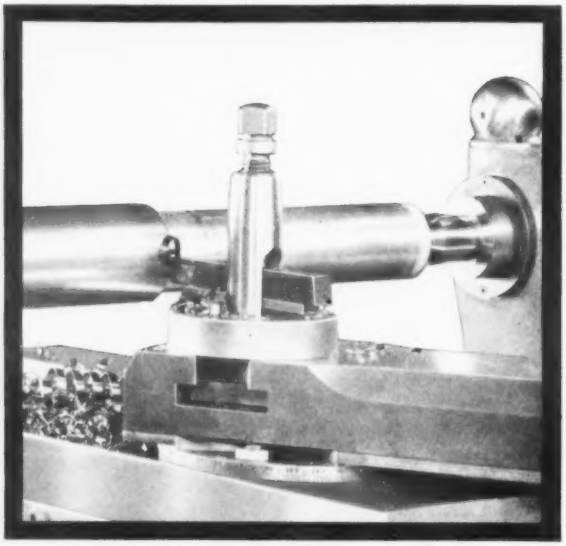
Rivett's 2 for 1 Lathe!



Sensitive...

As An Instrument Lathe

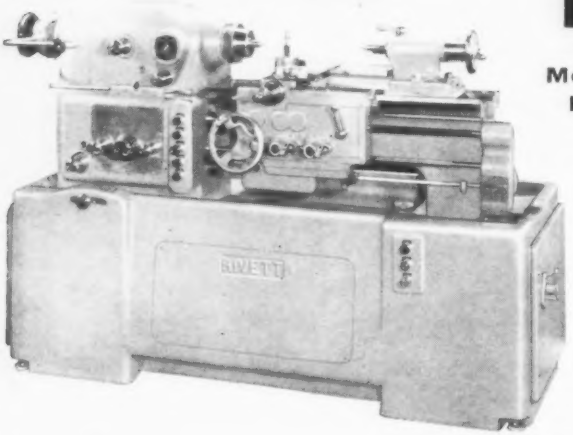
Responds to the lightest touch of the operator. Turns within .0004″ in 12″ length!



POWERFUL...

As An Engine Lathe

Full horsepower transmitted to spindle. Takes ¼″ chip with .020″ feed on cold rolled steel.



Model 1020S "Steelway" PRECISION TOOLROOM LATHE

This lathe has the industry talking! Because of extreme precision, it has long been recognized as the top tool by master mechanics. Now, its adaptability and broad usefulness have highlighted its productivity. As one satisfied user states, "Our toolmakers go to a Rivett first in preference to our other lathes!"

RIVETT LATHE & GRINDER, INC.

Dept. IA-7, Brighton 35, Boston, Mass.

Go to Rivett now for information about this big, beautiful machine.
Send for bulletin 1020B.

RIVETT

"Steelway" Lathes

KEYSTONE XL WIRE STUDY

Wider diameters with less cracking on specials

Up to 4 times the die life on production runs

Eliminate one shaving operation

Consistent quality products

...for UNIVERSAL SCREW COMPANY using KEYSTONE XL WIRE

flowability IS THE SECRET

Here are a few products cold headed by Universal Screw Company, Evanston, Ill. This firm has used Keystone Heading Wire since 1950. Their president, Arnold Meyer, says, "We prefer Keystone for their flexibility, prompt attention, freedom from complaints on their wire and willingness to work with us. We have found Keystone Wire gives less grief, and we've been able to produce many difficult parts because of the exceptional *flowability* of Keystone Heading Wire. Keystone's delivery schedules are strictly adhered to. We have cut our inventory substantially because of Keystone's excellent service."

See your Keystone representative for complete details — or, for the name of Keystone Wire users who can help you, call us.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

View of a few of the modern thread rolling machines at the Universal Screw Company, Evanston, Illinois.

Keystone Steel & Wire Company, Peoria 7, Illinois

Brand New . . . COLD HEADING FACTS FOLDER . . . send coupon today! New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____

"Harry, why did the boss switch to Dow Trichloroethylene?"

"That's simple, Jess—he figures it does a better job."

"In what way?"

"High solvent power, high stability. Superior degreasing performance thoroughly removes oils, tars and resins. Special inhibitors keep it stable after repeated degreasing and distillation runs. All around high quality."

"Nothing low down about this solvent, eh, Harry?"

"On the contrary. Relatively low boiling point makes it easier to handle the work after degreasing. And the narrow boiling range indicates the purity of the solvent."

"Sounds like it will do a good job."

"That's right, Dow Trichloroethylene does a good cleaning job and is safe to handle, too. Classified as nonflammable and nonexplosive at ordinary temperatures. Doesn't produce a flash by either the closed cup or open cup test."

"Say, Harry, sounds like you're selling this stuff."

"I'm not, but Dow is."

"Who?"

"Dow. Same people who sell Dow Perchloroethylene Industrial for vapor degreasing, Dow Methylene Chloride for stripping and Chlorothene® for cold cleaning. THE DOW CHEMICAL COMPANY, Midland, Michigan."

YOU CAN DEPEND ON DOW

call KE for plant expansion or new facilities

I N G E N U I T Y

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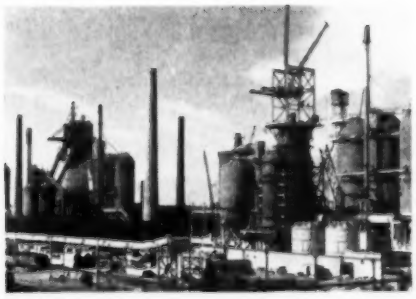
has made KE a major engineer-contractor serving Steel



At India's mammoth Tata works, at Jones & Laughlin, at Kaiser Steel—Kaiser Engineers' ingenuity advances the art of making steel.

KE can take your development thoughts from a gleam in your eye through start-up. KE performs any part—economic analysis, plant location, engineering, design, procurement, expediting, construction. One contract can cover all.

For your next plant or expansion, take advantage of KE's cost-saving ingenuity and wide experience in Steel.

KAISER ENGINEERS engineers-contractors
Contracting since 1914

Kaiser Engineers Division of Henry J. Kaiser Company • Oakland 12, California • New York, Pittsburgh, Washington, D.C., Buenos Aires, Calcutta, Dusseldorf, Montreal, Sydney, Tokyo

4364

for Materials...

The new model HA "PAYLOADER" tractor-shovel is so fast, flexible and efficient for loading and unloading boxcars that more and more industrial users of loose, dry materials get their shipments in bulk and realize substantial savings in freight rates and handling costs.

The "PAYLOADER" above is one of several at a pier transferring a shipload of China Clay into boxcars. This little "PAYLOADER" handles larger loads and delivers more tons per hour than heavier machines with bigger engines, yet has a smaller turning radius for better and faster maneuvering in and around boxcars.

The 40-degree tip-back of the bucket at ground level permits the operator to get and hold big loads close and low. The hydraulic load-shock-absorber, a standard equipment feature, makes it possible to carry and move more material with less spillage, faster, with better stability and greater safety.

For unloading or loading boxcars or stock-pile work, this new HA "PAYLOADER" enables the same operator to handle from 50 to 100% more than with older-style machines according to actual user reports.

Your nearby "PAYLOADER" Distributor will be glad to demonstrate. The Frank G. Hough Co., 733 Sunnyside Ave., Libertyville, Ill.

97A

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY INTERNATIONAL HARVESTER COMPANY

for Scrap...

One of the many special attachments available for the model HA "PAYLOADER" tractor-shovel, is the tine bucket being used here to scoop-up and load light-metal scrap at low cost. Special buckets are also available to handle other special materials.

Lift fork, crane hook and other useful attachments can also be provided. They mount quickly on, or interchange quickly with the regular bucket, to handle a variety of jobs and loads.

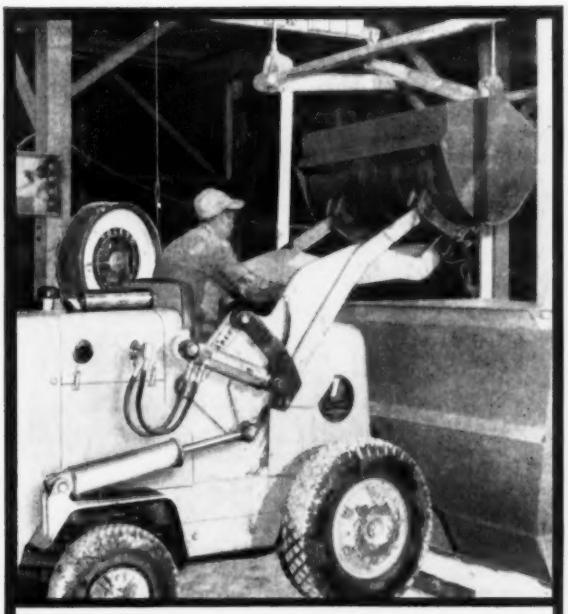
A floor-sweeping attachment is also available for the model HA. In fact, one is on hand at the location pictured, and sweeps aisles, runways and work areas at regular intervals. It mounts quickly on the front of the regular bucket, sweeps into it, and carries and dumps the sweepings wherever desired.

When the "PAYLOADER" can be kept completely busy during the day on regular bulk-handling operations, some users prefer to use the sweeper attachment "after hours" or during night shifts.

Other valuable off-shift or odd-job tasks for the model HA includes snow removal, using the regular bucket, a large snow bucket, or a snow plow attachment. The Frank G. Hough Co., 733 Sunnyside Ave., Libertyville, Ill.

97B

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY INTERNATIONAL HARVESTER COMPANY



for Batching...

One man on a model HA "PAYLOADER" tractor-shovel, feeding a scale or weighing hopper, measures out 10,000 pound batches within 5-pound accuracy at this vitreous china plant. Four to five trips do the job. While spilling the last bucket load into the scale hopper, the operator watches the dial scale and at the exact instant tilts back the bucket and stops the dumping.

Precise, one-lever control of the hydraulic bucket tilt of the model HA is one of the reasons why this versatile tractor-shovel is an essential part of this fast and accurate batching procedure. Another "PAYLOADER" feature, contributing to the success and efficiency of this operation, is the speed with which it shuttles between stockpile and scale hopper with full bucket loads of the raw material.

The model HA is the smallest of the complete "PAYLOADER" tractor-shovel line, with sizes ranging from 2,000 to 9,000 lb. carrying capacity and choice of engines for gasoline, diesel or LPG for most models. The nearby Distributor has full sales and service facilities. The Frank G. Hough Co., 733 Sunnyside Ave., Libertyville, Ill.

97C

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

for Turnings...

A new and revolutionary use of the model HA "PAYLOADER" in metal-working shops has been created with the development of a detachable bucket called the "Payhopper". This special bucket on casters can be spotted at stamping presses, lathes, milling machines, screw machines, or at other convenient points to receive scrap or product.

The "PAYLOADER", fitted with a special bolster and quick-detachable coupling, latches on to the "Payhopper" and lifts, carries and dumps it wherever desired — can even dump the contents into bins or trucks.

One "PAYLOADER" can serve many such "Payhopper" units scattered throughout a plant. The four large casters on each "Payhopper" enables one man to push it easily, either empty or loaded, in or out of spots not directly accessible to the "PAYLOADER".

The model HA "PAYLOADER" readily negotiates 6 ft. aisles and travels at speeds up to 10 mph. Torque-converter drive is a standard feature that makes operation easy, insures smooth starts and "inching" control and almost entirely eliminates "clutching" and clutch maintenance. The Frank G. Hough Co., 733 Sunnyside Ave., Libertyville, Ill.

97D

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Modern Window Mullion Tubes by Standard

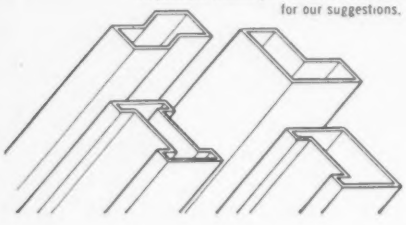
The Browne Window Manufacturing Company specified Standard Mullion Tubes for the Exchange Bank and Trust Company, Dallas, Texas. Standard Mullion Tubes—1¾" x 4" x .180 wall—were chosen for strength and functional utility. Thousands of feet of this tubing hold the curtains of glass and colorful insulated spandrels that make this building as modern as tomorrow.

Specified for Dallas Exchange Park Building . . . City of Tomorrow

Standard Tube is pleased to be a part of the Dallas Exchange Park—a veritable "city within a city" consisting of 4 multi-storied buildings, a thousand room hotel, a medical research center, 150 retail shops, a 4 story building to house a major department store. We are specialists in square, rectangular and special tubing for a multitude of applications ranging from modern lightweight tubular furniture to rugged structural members for agricultural machinery, as well as for architectural applications.

We produce square tubing ranging in size from ¼" OD to 4" OD up to ¼" wall thickness and rectangular and special shapes of equivalent sizes. For full information on Standard products, plant facilities and engineering assistance, write for free 8 page folder.

Many complicated square, rectangular and special-shaped tubes are possible. Submit your ideas to Standard for our suggestions.



STANDARD

THE STANDARD TUBE COMPANY

24400 PLYMOUTH ROAD • DETROIT 39, MICHIGAN

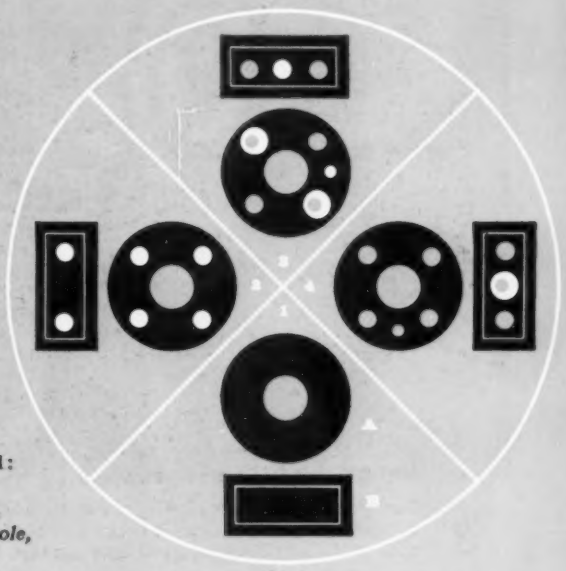
Welded stainless tubing and pipe • Welded carbon steel mechanical • Boiler and heat exchanger • Exclusive rigidized patterns • Special shapes • Steel Tubing—Sizes ½" OD to 5¼" OD .028 to .260 wall • Stainless Pipe—Schedule 40: ⅛" to 2" I.P.S.; Schedules 5 and 10: ⅛" to 4" I.P.S.—Stainless Tube—¼" to 4¾" OD—.025 to .165 wall

Natco Naturals

Cost-Cutting Ways
You Can Use
Standard Multi-Spindle Natcos

Any time your parts require machining *more than one hole*–drill, bore, face or tap–it may well be a "Natco Natural." Your standard Natco will produce substantial savings in a surprising number of situations, *even in small job-shop lots!* Call in your nearby Natco field engineer; he'll tell you in short order whether you've got a "Natco Natural" there.

Multiple Drilling Operations on Two Part-faces

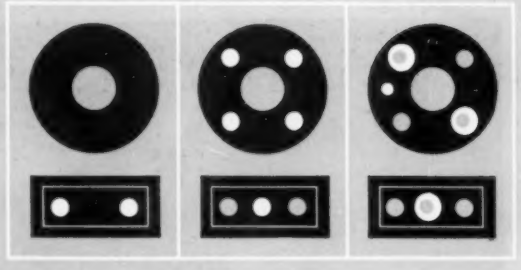


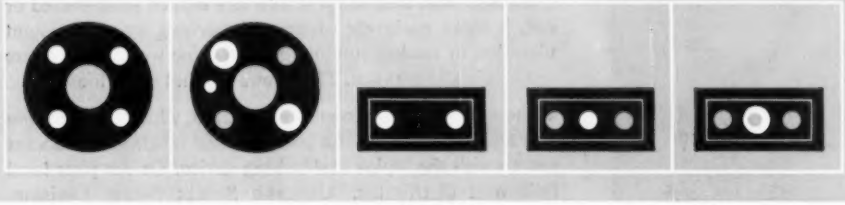
130 parts per hour–4-position rotary table. POSITION #1: *Unload finished part, transfer half-finished part, load new part.* POSITION #2: *Drill 4 holes, Face A. Drill and countersink 2 holes, Face B.* POSITION #3: *Drill 1 hole, ream 2 holes, Face A. Drill 1 hole, Face B.* POSITION #4: *Trepan 1 hole, Face B.*

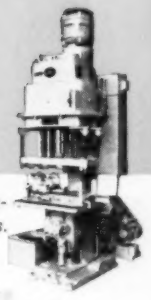
65 parts per hour–stationary fixture *with 5 work locations. Operator transfers parts after each stroke. One part completed per stroke.*

40 parts per hour–straight-line indexing. *After every 3 strokes, operator unloads finished part, transfers half-finished part and loads fresh part.*

23 parts per hour–tumble-type fixture. *Operator transfers and tumbles fixture from one position to the next. One part completed every five strokes.*







Standard multi-spindle Natcos range from 1 hp, 10-spindle machines to 50 hp machines with up to 72 spindles. Spindles in standard Natcos are driven through universal joints and located by either adjustable arms of bored slip plates.

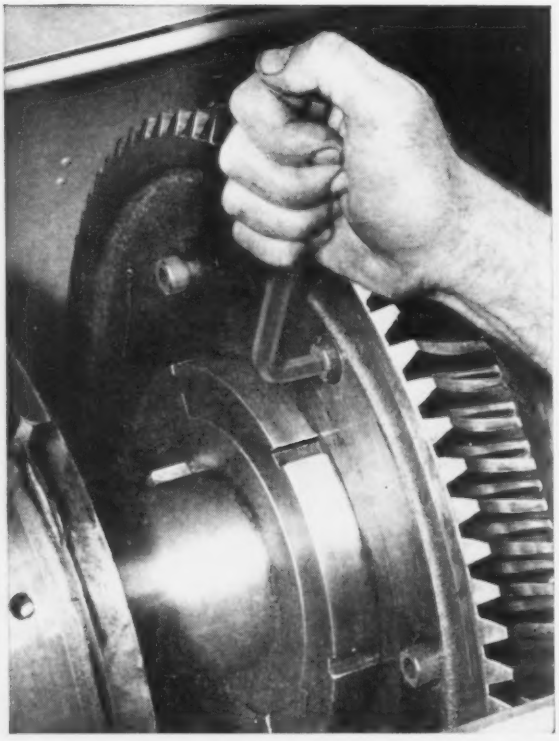
NATCO

National Automatic Tool Company, Inc.

Richmond, Indiana

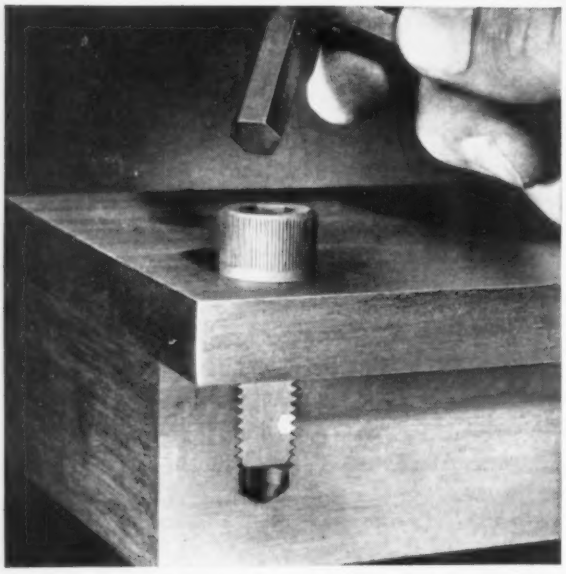
Multi-spindle drilling, boring, facing & tapping machines. Special machines for automatic production.

Call Natco Offices in Chicago, Detroit, New York, Buffalo, Boston, Philadelphia, Cleveland, Los Angeles; distributors in other cities.



The ordinary fasteners securing the worm wheel to the drum shaft in this automatic screw machine loosened, causing $120 worth of damage to parts. Labor for the repair job cost $100. The ordinary fasteners were replaced with self-locking UNBRAKOS, and there has been no trouble since.

Vibration won't loosen self-locking UNBRAKO socket cap screws



HOW IT LOCKS. The tough, resilient Nylok locking pellet keys itself into the mating threads. It forces threads together and locks the screw securely—whether or not the screw is seated.

UNBRAKO socket screws with the Nylok* self-locking device eliminate fastener problems caused by vibration.

Take the drive system in the automatic screw machine illustrated above, for example. The screws originally used to secure the worm wheel to the drum shaft loosened, causing considerable damage, besides loss of production time. These have now been replaced with self-locking UNBRAKO socket head cap screws and the trouble has been eliminated.

An UNBRAKO socket screw with the Nylok self-locking device is a single unit. Just screw it into any tapped hole. Seated or not, it locks positively wherever wrenching stops. Constant vibration or endless running of a machine won't affect these self-locking UNBRAKOS. The screws will not work loose!

Write today for your copy of Form 2193, which gives catalog and technical data on the complete line of UNBRAKO socket screws with the Nylok self-locking device. Or see your local industrial distributor. Unbrako Socket Screw Division, STANDARD PRESSED STEEL CO., Jenkintown 17, Pa.

UNBRAKO® SOCKET SCREW DIVISION

STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN ■ PENNSYLVANIA

*T.M. Reg. U.S. Pat. Off., The Nylok Corporation

"With Weirkote® you can forget plating or dipping after fabrication. It just won't peel or flake!"

Q.—Weirkote—is that a new kind of steel?

A.—*"New" only to those who don't know of its advantages. It's a zinc-coated steel with a skin-tight surface, produced by a continuous galvanizing process instead of the old pot-dip method.*

Q.—Well, we've tried galvanized before for the parts and products we make. But it just couldn't stand up under the punishment of fabrication.

A.—*Must have been the old type galvanized. When you use Weirkote for fabrication, you'll find its surface stands up under the severest stresses. Punch it, lock it, crimp it, deep-draw it—its zinc coating stays intact. It's got a* built-in *resistance to peeling and flaking.*

Q.—Well, say—that'd save all the cost of plating or dipping after fabrication, wouldn't it?

A.—*Exactly! Plus assuring you a* uniform *protective coating at all times—something even a special coating doesn't always provide on the more intricately fabricated parts.*

Send today for free booklet that details the time- and cost-saving advantages of using skin-tight zinc-coated Weirkote. Write Weirton Steel Company, Dept. A-1, Weirton, West Virginia.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA
a division of
NATIONAL STEEL CORPORATION

SCIAKY®
HELPS PUT PROFIT INTO MANUFACTURING

How Massey-Harris-Ferguson Achieves Mass Production Economy on Short Runs

Among manufacturers whose production requirements for any given part are limited, resistance welding is often regarded as an impractical method of fastening. They agree it is fine for mass production where tooling costs and setup time can be spread out over tens of thousands of parts. But for them, the cost of tooling and fixturing anything but the simplest assemblies would be uneconomical.

The Cost Research Department of Massey-Harris-Ferguson, as part of a program to reduce manufacturing costs, undertook an investigation of resistance welding. Under the direction of Mr. E. E. Hart, the investigation emphatically proved the economy and dependability of the process for a wide range of limited production assemblies.

Simplification of setup is key

The Cost Research Department reasoned that the key to the entire problem depended entirely on minimizing setup time, complete simplification of tooling and fixturing and positive dependability and consistency of the fabricating method. Mr. Hart was convinced proper resistance welding techniques would satisfy all these requirements. Subsequent developments and testing proved him right.

How the problem was solved

Basic tooling and fixturing was built right into the welder. (See Figs. 1 and 2.) The various assemblies required only the simplest tooling. Individual tooling for any assembly seldom cost as much as $75 per weld.

Setup time for any assembly was reduced to an average of 30 minutes. The performance of the welders themselves was carefully studied and recorded. Machine control setup for any assembly was reduced to a simple matter of the briefest reference to graphs.

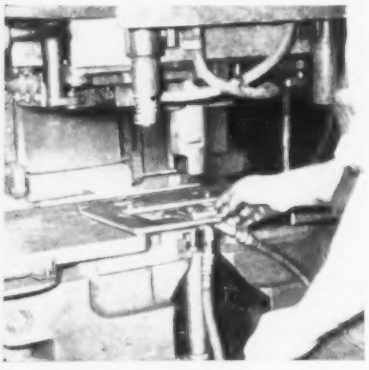


Fig. 1 Close-up of simple tooling required for a baler pick-up crank assembly.

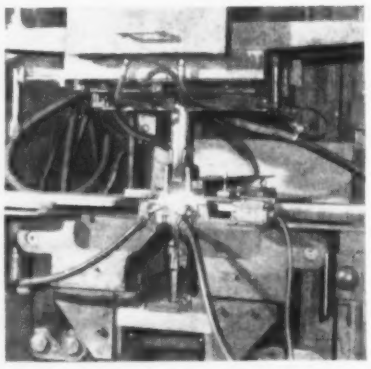


Fig. 2 Note universal fixturing table and simple dies used for welding a yoke assembly.

Cost reductions achieved

The large number of assemblies fabricated by resistance welding include many structural members. Castings, forgings and arc welded assemblies have been replaced with resistance welded assemblies of standard sheet or bar stock and screw machine products.

The cost of the resistance welded part averages 10 to 40% less than similar arc welded parts. The savings in time of the welding operation itself averages 60 to 90%. Castings and forgings suffer in comparison, with savings of over a dollar per unit not unusual.

Fig. 3 Typical assemblies resistance welded on Sciaky equipment at M-H-F.

Quality welding essential

The success of such a program requires that the welders be capable of producing consistently high quality welds with maximum ease of control setup. Sciaky patented three phase welders easily meet these requirements.

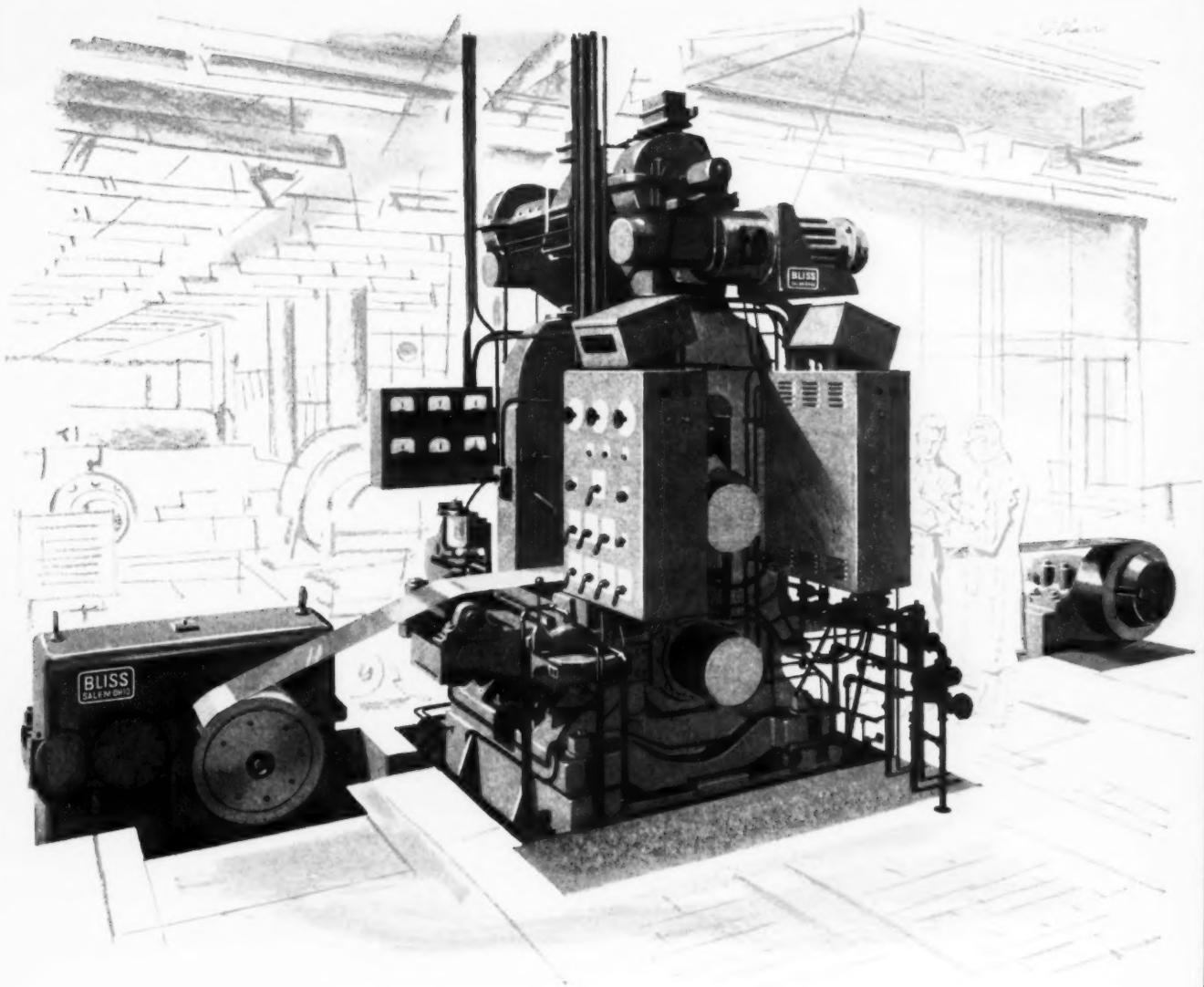
Detailed information available

Two bulletins are available giving more complete information on the Massey-Harris-Ferguson program. "Resistance Welding at Work," Vol. 5, No. 1 (16 pages), gives data, including cost reductions, on 28 different M-H-F assemblies. An engineering report on "Design Standards" (48 pages) gives full technical data on the eight basic weld types employed. Copies of either or both bulletins are available on request.

Write today, mentioning the information you would like to receive. There is no obligation. Sciaky Bros., Inc., 4923 W. 67th St., Chicago 38, Ill. POrtsmouth 7-5600.

DO YOU HAVE A RESEARCH PROBLEM?

Facilities of the Sciaky Research Division at Los Angeles, California, are available for contract research to answer resistance welding problems. Housed in a 15,000 sq. ft. building, these facilities include an experienced engineering staff, a complete range of the most advanced resistance welding machines including the largest in the world and a laboratory equipped for metallography, chemistry, electronics, photography and testing as applied to resistance welding. Write for further information and ask for the 20 page Research Division brochure.



This Bliss 4-high reversing mill is the principal unit in National Cash Register's new cold rolling department.

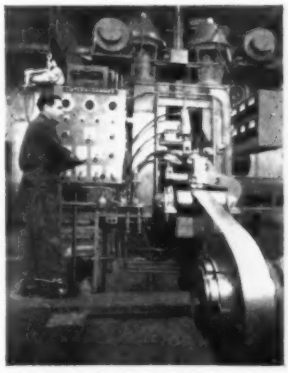
When does it pay to "roll your own"?

The National Cash Register Company's Dayton, Ohio, plant had a problem. It couldn't always get enough special strip for the stamped parts of its business machines.

National Cash Register solved the problem by deciding to "roll its own"—and then asked Bliss to help work out the equipment it would need. The end result is a complete cold rolling department, designed and built by Bliss. It includes a 4-high 5¾" and 16" by 12" reversing mill, a 14" shear line, and a 12" slitting line.

Today, National Cash Register tailors standard steel strip to the exact thicknesses, widths and lengths it needs. Its new Bliss equipment turns material out fast and economically, and there are no more shortages to plague the plant's press department.

This installation shows how Bliss engineers can solve a customer's problem. To see how Bliss has handled others, write today for a copy of the 60-page Bliss Rolling Mill Brochure, Catalog 40-A. It's yours for the asking.



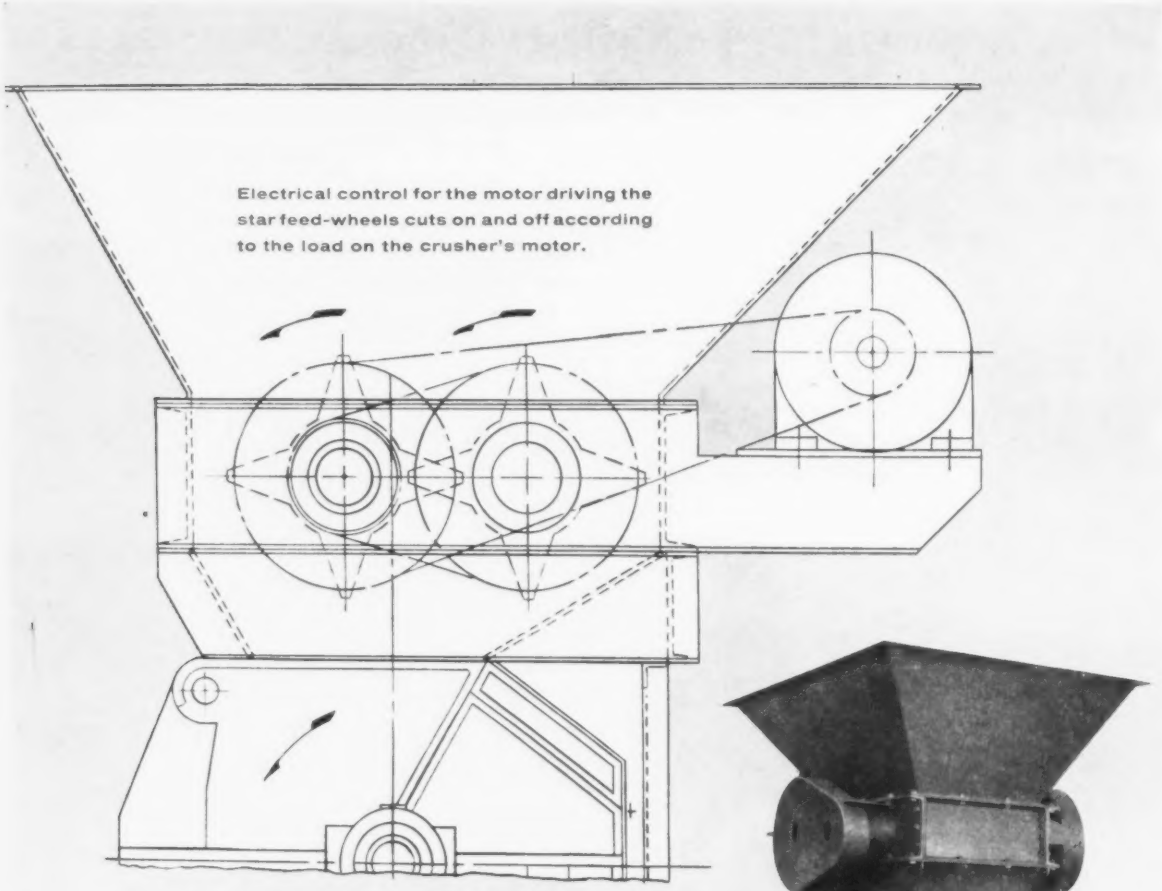
Bliss mill rolls 10"-wide strip down to .009" at speeds up to 400 fpm.

BLISS
SINCE 1857

100 years of making metal work for mankind

E. W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio

Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio



Electrical control for the motor driving the star feed-wheels cuts on and off according to the load on the crusher's motor.

This new Jeffrey feeder fits every size of Jeffrey crusher, from 1 ton per hour up to 20 tons per hour.

NEW JEFFREY

Metal-Turnings Feeder

works crusher at full load and prevents stalling

• Metal turnings are profitable when they're reduced to a shoveling size. Jeffrey crushers perform that task well, simplifying handling, cutting costs for hauling, and permitting reclamation of valuable oils.

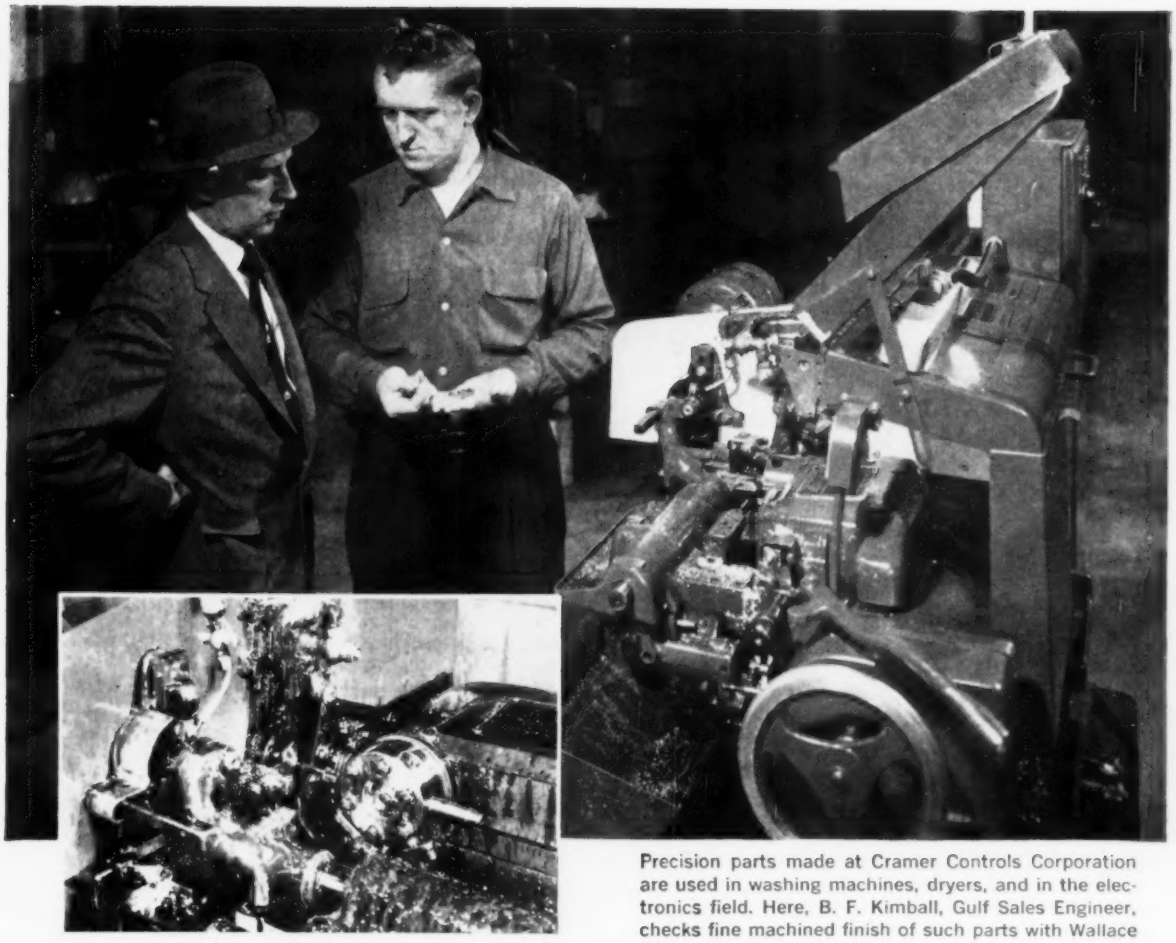
But feeding a crusher has always been a problem, with workers tugging and shoveling, while taking care not to stall the motor by crowding the crusher. Jeffrey's new metal-turnings feeding device cuts labor to a minimum, while keeping the crusher working at maximum capacity.

The hopper takes 2 to 3 cubic yards of turnings, so it can be filled directly from tote boxes or magnets. The star wheels force turnings down into the crusher until its drive motor "complains" to the electrical controls. The feed shuts down temporarily, but starts again as the load slacks off.

For complete data, get in touch with The Jeffrey Manufacturing Company, 925 North Fourth Street, Columbus 16, Ohio.

CONVEYING • PROCESSING • MINING EQUIPMENT . . . TRANSMISSION MACHINERY . . . CONTRACT MANUFACTURING

JEFFREY



Precision parts made at Cramer Controls Corporation are used in washing machines, dryers, and in the electronics field. Here, B. F. Kimball, Gulf Sales Engineer, checks fine machined finish of such parts with Wallace Perzanoski, Foreman. The cutting oil: Gulfcut 31A.

Closer tolerances, longer tool life with GULFCUT!

Cramer Controls Corporation, Ballouville, Connecticut, makes precision parts for Cramer synchronous motors and electrical timing devices. For the past 2 years this plant has used Gulfcut 31A in its battery of Browne & Sharpe automatic screw machines . . . with excellent results.

"Gulfcut 31A," according to Wallace Perzanoski, Foreman of the automatic screw machines, "gives us excellent tool life—which of course has helped us boost production—and helps us hold to closer tolerances."

Other users of Gulfcut 31A cite such benefits as reduction in number of rejects, finer finishes, and lower machining costs.

The complete Gulfcut line includes many different types of cutting oils to meet every metal cutting need. Selection of the proper cutting oil can help you improve operations, increase tool life, cut overall costs. Contact your nearest Gulf office and ask a Gulf Sales Engineer to call.

GULF OIL CORPORATION
1822 Gulf Building
Pittsburgh 30, Pa.

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

Stop heat losses with

VEGALITE
Unique silica insulating brick. For service up to 3000° F.

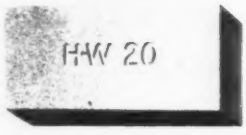
H-W 30
Maximum service temperature 3000° F.

H-W 28
Maximum service temperature 2800° F.

H-W 26
Maximum service temperature 2600° F.

H-W 23
Maximum service temperature 2300° F.

H-W 20
Maximum service temperature 2000° F.



H-W 16
Maximum service temperature 1600° F.

Seven distinct types afford four-way savings

1. Savings in fuel

The use of Harbison-Walker insulating fire brick greatly reduces heat losses and the amount of heat stored in the brickwork during operation, which causes loss of heat when the furnace is shut down.

2. Savings in time

With Harbison-Walker insulation the time required to bring the furnace to operating temperature is materially reduced. This is a distinct advantage when furnaces are operated intermittently.

3. Savings in space

Insulated furnaces may be built closer to each other without affecting the comfort of the workmen. This not only permits more efficient handling but also reduces capital expenditures for floor space.

4. Savings in weight

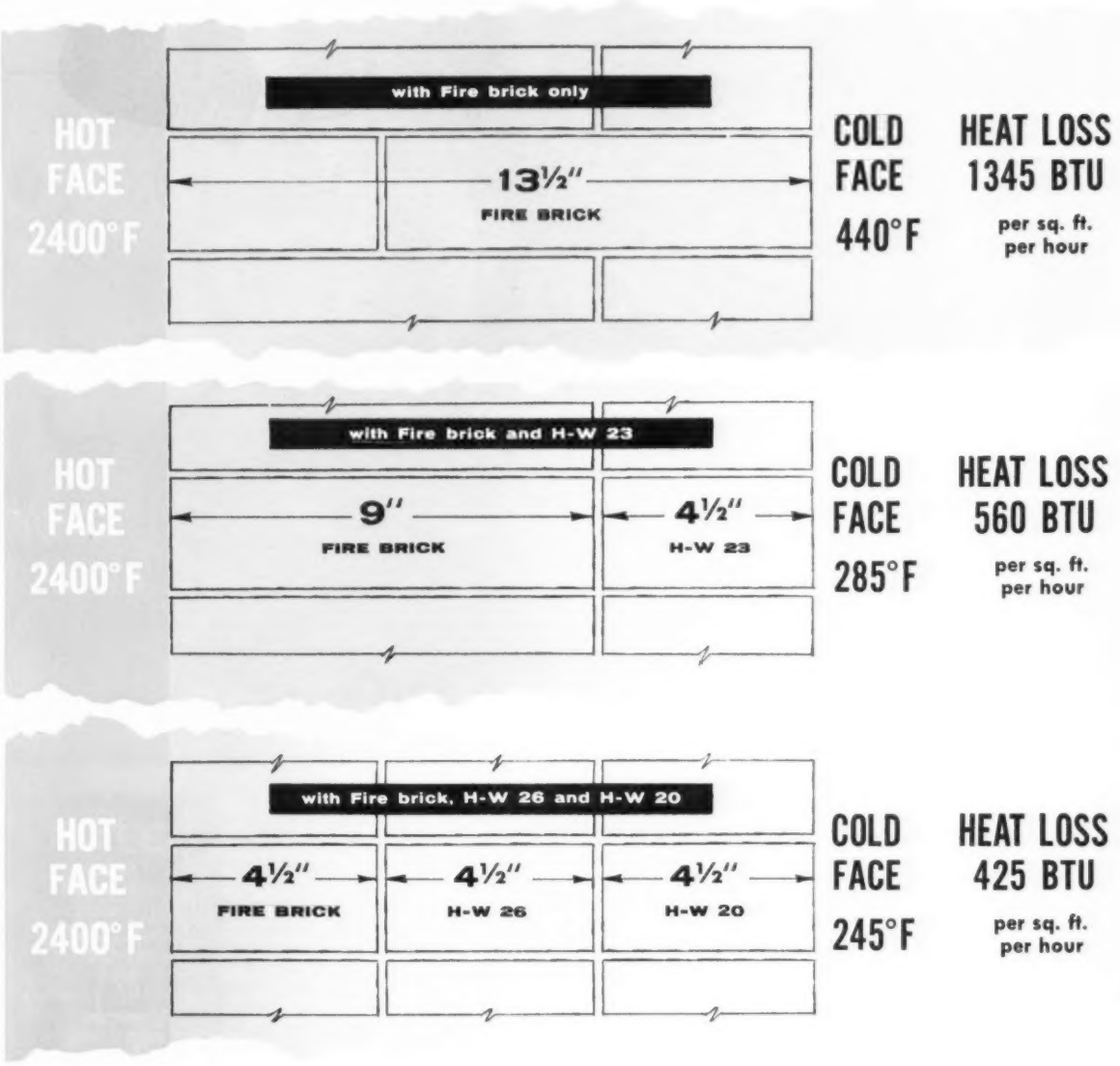
The reduction in weight of the furnace refractory structure often permits the use of a lighter foundation and lighter steel members in the form of buckstays, tie rods and other furnace bindings; also lighter door frames, doors and counter balance mechanisms.

HARBISON-WALKER REFRACTORIES COMPANY
AND SUBSIDIARIES

General Offices: Pittsburgh 22, Penna.

World's Most Complete Refractories Service

Harbison-Walker Insulating Fire Brick



These furnace sections show how heat losses are reduced by using Harbison-Walker Insulating Brick for backing fire brick furnace walls. The heat loss is reduced 58.4% in one case and 68.4% in the other. These are typical of savings that are frequently experienced.

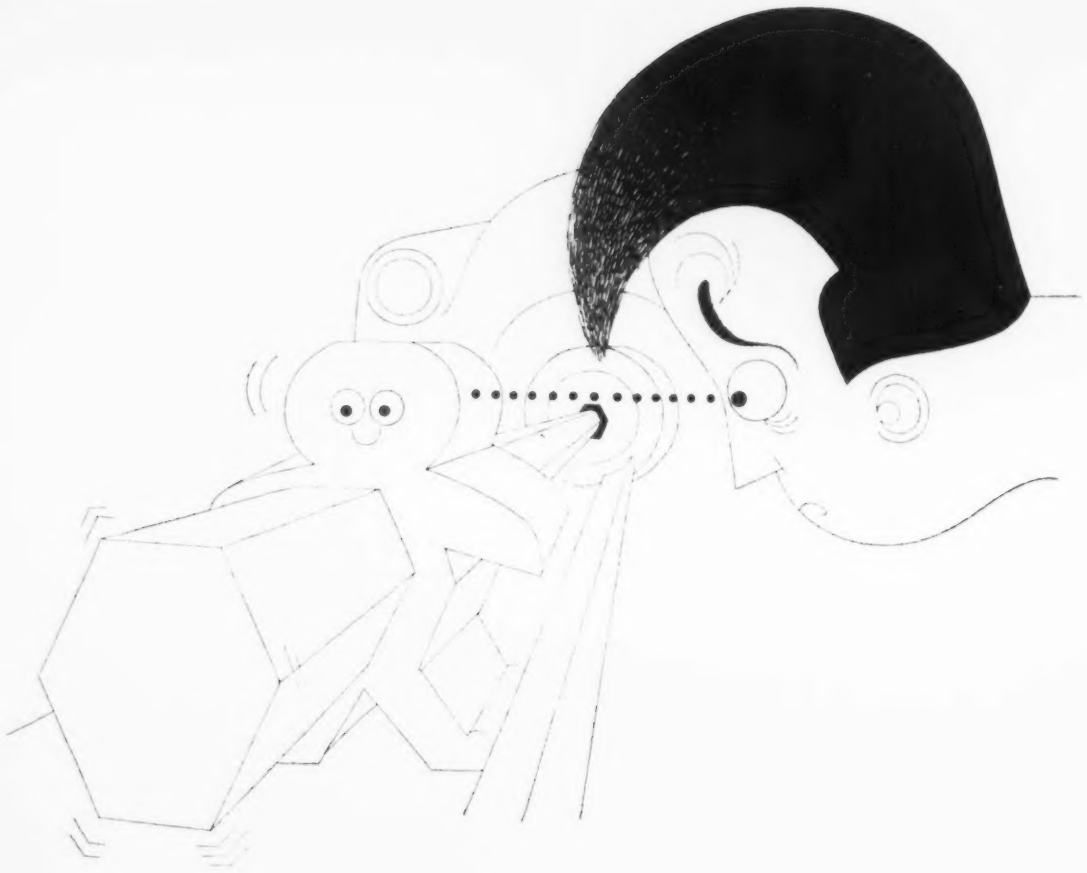
In addition to savings in fuel, floor space and weight, the use of insulating brick provides for faster heating and in some instances reduction of noise.

To assure best overall results, it is important that insulating refractories be carefully selected to secure the most advantageous combination of properties. Harbison-Walker having the full complement of both insulating and refractory brick, can furnish the correct combination for any requirement.

Harbison-Walker insulating brick have the balanced properties that mean dependable service. Light weight, essential to high insulating value and low heat-storage capacity, have been obtained to the greatest degree, consistent with the meehanical strength necessary for handling and for durability in service.

Harbison-Walker insulating products also include LOTHERM, the extra strength insulating fire brick; H-W Lightweight Castables; H-W Block Insulation and H-W Mineral Fiber Coatings.

Write for the H-W bulletin containing comprehensive engineering data.



Extrusion a problem?

THEN TRY CRUCIBLE CHRO-MOW HOT WORK TOOL STEEL. IT'S TOUGH, RESISTS WEAR AT ELEVATED TEMPERATURES. AND YOU CAN GET IT QUICKLY FROM LOCAL CRUCIBLE WAREHOUSE STOCKS.

CHRO-MOW possesses an excellent combination of toughness and red hardness, and resistance to heat checking. It also resists cracking during water cooling. CHRO-MOW is particularly recommended for mandrels and tools which reach 500 to 1000F in service.

There are dozens of special tool steels, like CHRO-MOW, regularly stocked at local Crucible warehouses.

Make Crucible your regular source for special steels and for helpful advice on their use. For Crucible is the only specialty steel producer *fully integrated to the point of use*. That means control and responsibility from raw material to warehouse delivery to you.

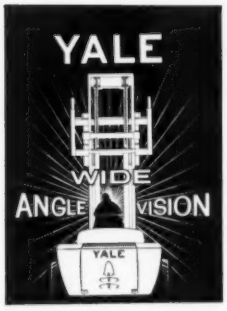
STOCKS MAINTAINED OF:
Rex High Speed Steel . . . ALL grades of Tool Steel (including Die Casting Die and Plastic Mold Steel, Drill Rod, Tool Bits, and Hollow Tool Steel Bars) . . . Stainless Steel (Sheets, Bars, Wire, Billets, Electrodes) . . . Max-el, Hy-Tuf, AISI Alloy . . . Onyx Spring, Hollow Drill Steel and other special purpose steels.

CRUCIBLE WAREHOUSE SERVICE

Crucible Steel Company of America

General Sales Offices: The Oliver Building, Mellon Square, Pittsburgh 22, Pa. Branch Offices and Warehouses: Atlanta • Baltimore • Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Dayton • Denver • Detroit • Grand Rapids • Harrison • Houston • Indianapolis • Los Angeles • Milwaukee • New Haven • New York • Philadelphia • Pittsburgh • Portland, Ore. • Providence • Rockford • San Francisco • Seattle • Springfield, Mass. • St. Louis • St. Paul • Syracuse • Toronto, Ont.

New Yale High-Capacity Gas Trucks with 300% MORE VISIBILITY



Only new Yale 15,000-20,000 lb. capacity Gas Trucks offer you "Wide-Angle Vision"—Yale's exclusive feature that gives the driver 300% more visibility for greater safety. Design advances such as nesting of upright channels; wide spacing of lifting channels and hoisting cylinders; high, center location of driver's seat assure not just unobstructed center visibility but also a greater arc of vision. New Yale Gas Trucks also feature a low center of gravity, a broader lifting base, wide channel-roller spacing and large high-flotation tires for maximum stability even under capacity-load conditions. Lifting speed of 60 feet per minute, fast controlled lowering, travel speed up to 20 MPH assure fast cycle operations.

Features Important in Handling FABRICATED METALS:

• I-beam side members in frame for extra strength • Channels mounted on ball-bearing rollers to reduce friction and wear • Ball-mounted, self-aligning hoisting cylinders • Your choice of Fluid Coupling or standard transmission.

To meet the need of expanding industries for better materials handling methods and equipment, look to Yale for advances in research, engineering, manufacturing, sales and service—as YALE BUILDS FOR THE NEW ERA

YALE*

INDUSTRIAL LIFT TRUCKS AND HOISTS

*REG U S PAT OFF

Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers Warehousers • Hand Trucks • Hand and Electric Hoists

MAIL THIS COUPON TODAY

The YALE & TOWNE Manufacturing Co., Dept. A-917, Roosevelt Boulevard, Philadelphia 15, Pa.

Please send me the new Yale High-Capacity Gas Truck Bulletin No. 5230.

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Company_____

Address_____

City_____ Zone____ State_____

In Canada: write The Yale & Towne Manufacturing Co., St. Catharines, Ontario, Canada

Variety
Economy
Quality

Johnson Standard Stock Bearings

You save time and money when you use Johnson standard stock bearings, but not at the cost of lowering tolerances or limiting freedom of design. Over 900 sizes of these bearings in over 200 combinations of inside and outside diameters are available in a number of lengths machined to exacting tolerances.

Your savings come from the economies of volume production and the elimination of tool and die charges. Time is saved because shipment is made from distributor stocks in your vicinity.

If you are not taking advantage of the economy and flexibility of Johnson standard stock bearings, write for full information including the name of your nearest Johnson distributor.

Johnson Bronze

505 South Mill Street • New Castle, Pa.

JOHNSON Bearings

GRAPHITED
over 175 sizes

GENERAL PURPOSE
over 900 sizes

UNIVERSAL BRONZE BARS
over 400 sizes

LEDALOYL
over 500 sizes

ELECTRIC MOTOR
over 350 sizes

JB71-IR

ALLENPOINT will give you a bulldog grip at no premium in price!

Allen's scientific redesign of the cup diameter on set screws gives greatly increased resistance to *withdrawal* torque. You can count on Allenpoint Set Screws to stay tighter longer, under heavy strain and vibrations. This dependable premium performance of Allenpoints is yours to use without increasing the cost of manufacturing your products.

Uniform Class 3A Threads

Allenpoints' smooth, uniform threads prevent off-lead conditions like Fig. 1. With Allenpoints, you have full, even contact between the engaging flanks of the threaded members (Fig. 2) —and a tight friction lock over the entire length of the Allenpoint Set Screw.

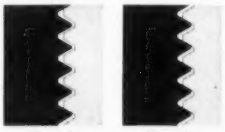
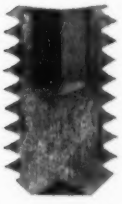


Fig. 1 Fig. 2

Strong, clean, deep sockets allow full wrenching leverage

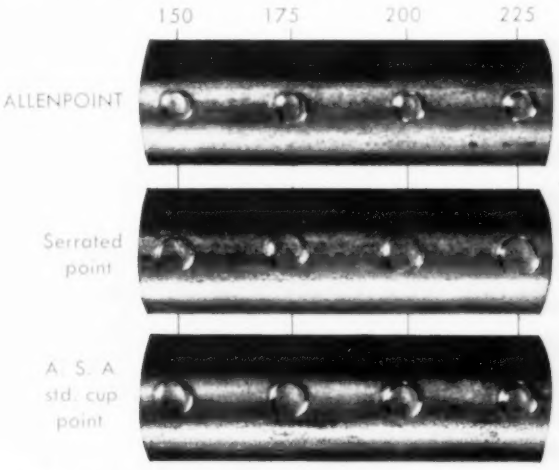


Sockets of Allenpoint Set Screws are cold forged to produce a deeper, smoother socket. No broach chips to interfere with proper seating of the key. This "pressur-forming" preserves the long steel fibers throughout the length of the screw—stronger walls allow maximum tightening torque.

One more full thread on ALLENPOINTS!

Allenpoint Set Screws have one more full thread than serrated point set screws. That means more holding power—especially important when you're using short lengths.

ALLENPOINT's performance compared for you



These actual-size, unretouched photographs show the cup pattern made by Allenpoints, serrated points, and A.S.A. standard cup point set screws in a 3/4" steel shaft. At each degree of tightening force, Allenpoints make a full circle pattern, penetrating deeper for greater holding power.

We'll be glad to send you more information and samples of Allenpoint Set Screws and other Allen Socket Screw products.

Stocked and sold by leading industrial distributors everywhere

ALLEN MANUFACTURING COMPANY
Hartford 2, Connecticut, U.S.A.

ALLEN HEAD

the modern bee uses

CF&I-WICKWIRE WIRE!

Modern bees have stopped storing honey in handy hollow trees. Instead, they choose man-made hives—hives which are neatly divided by wood and special round, tinned, hard drawn, low carbon CF&I-Wickwire Bee Wire.

Chances are you don't need wire to make bee hives. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

Check This List!

FOR THE WIRE YOU REQUIRE, SEE CF&I-WICKWIRE.

FLAT AND SHAPED WIRES
Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE
Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire
Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE
Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)
Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE
Bag Tie Wire
Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
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Welding Wire
Wissco Iron Wire
Industrial Quality Wire
Cold Rolling Quality Wire
Heading, Forging or Roll Threading Quality Wire
Medium High Carbon Wire

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...here's "manpower" that hands you a bonus!

Think how many of your plant's handling jobs can be accomplished with much less effort—swiftly and profitably—by one operator "teamed up" with a powerful Towmotor fork lift truck!

You get an entirely new concept of modern mass-handling. You get a "bonus" in extra profits because you multiply manpower with the payroll you have. And you get a bonus in plant-wide morale when work flows on-schedule through every department . . . effortlessly . . . with a bigger day's work done.

Called the "ideal" fork lift truck by management and operators alike, the latest Towmotor models offer exclusive features as advanced as these, at no extra cost:

- New-concept functional engineering
- Simplified dual-entry compartment
- Full-traction weight distribution
- Adjustable off-center visibility
- New *motion-studied* centralized control
- Towmotor improved precision steering

Power steering, 'TowmoTorque' Drive at extra cost

These and 60 other points of superiority are described in Towmotor booklet SP-23 for comparison. Get a copy from Towmotor Corporation, Cleveland 10, Ohio.

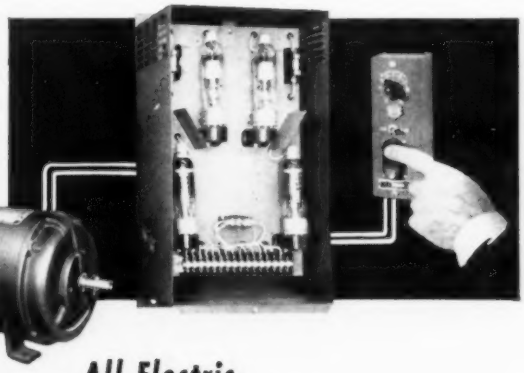
Leaders for 38 years in building Fork Lift Trucks and Tractors

TOWMOTOR THE ONE-MAN-GANG ® -GERLINGER

Gerlinger Carrier Co., Dallas, Oregon, is a subsidiary of Towmotor Corporation, Cleveland, Ohio

New!

RELIANCE V•S Jr.



All Electric
Variable Speed Drive
with Finger-tip Control

The new V•S Jr. gives you instantaneous speed changes, even under load, without belts, pulleys, or gears. This Reliance Drive puts complete machine control at the operator's fingertips. All functions, jog, start, stop, reverse and speed changes are placed in a compact, remote control station.

The 8 to 1 motor speed ratio puts extra flexibility into your machinery. Speeds may be changed through this wide range as frequently as required. The motor will operate through a 100 to 1 speed range for jogging or light intermittent duty.

There's a big power cushion in the motor too . . . power for smooth speed pick up, even under heavy shock loads, and dynamic braking for fast controlled stops without shuddering or jerking.

The Reliance V•S Jr. is your answer to machinery drive problems in the ¾ to 4 horsepower range. Package construction makes installation easy; just plug it in to a single phase 220 or 440 volt a-c. line.

Write for Bulletin D-2505 for complete details. D-1554

RELIANCE R ELECTRIC

AND ENGINEERING COMPANY
DEPT. 27A, CLEVELAND 17, OHIO
CANADIAN DIVISION: WELLAND, ONTARIO
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With Norton barrel-finishing abrasives and methods

Manufacturer Saved Over $90,000 First Year

A prominent aircraft parts manufacturing company reports the following savings — typical of very many — gained by shifting from hand-finishing to Norton TUMBLEX* abrasives and barrel-tumbling techniques:

Number of Parts	Cost of Hand-Finishing	Cost of Barrel-Finishing	SAVINGS
312,906	$.1149	$.0207	$29,475.75
30,724	.091	.013	2,692.42
25,599	.114	.014	2,559.90
25,685	.100	.012	2,260.28
9,347	.103	.020	770.50

Total savings for all parts — including many more made by this single company — amounted to well over $90,000 the first year and is increasing steadily.

This is just one example of the amazing economy forward-looking firms are chalking up by converting to the know-how and materials Norton offers to all industry.

Your own metal parts can range from tiny needles to hefty forgings. They may be simple or complicated, hard metals or soft. Whatever they require, deburring, descaling or finishing to close tolerances — here's what you need to cut these operations to lowest cost.

Thorough knowledge of the right size, type and shape of tumbling abrasives to use, and just how to use them.

You can get these "Touch of Gold" advantages from Norton. Just send sample parts to our Sample Processing Department and you'll be forwarded finished parts with complete facts as to abrasives, methods and equipment. Or write for further information to NORTON COMPANY, General Offices, Worcester 6, Mass. Plants and distributors all around the world.

G-327

ALUNDUM* TUMBLEX "S". Bonded spheres that get into areas where other shapes can't reach. Exceptionally dense and long lasting. Five sizes.

ALUNDUM TUMBLEX "T". Bonded, triangular and fast-cutting for special shaped parts. They won't wedge in work slots or holes. Four sizes.

ALUNDUM TUMBLEX "A". For general barrel-finishing. Removes flash, scale, tool marks and burrs, while forming radii and finishes to required microinches. Twelve sizes.

TUMBLEX "N". Natural stones, exclusively Norton. For high lustre, especially on die castings and soft metal. Rounded shape brings up highest lustre. Seven sizes.

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ABRASIVES

Making better products . . . to make your products better

NORTON PRODUCTS:
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WALLACE BARNES STEEL DIVISION – Producer of High-Carbon Strip Steel

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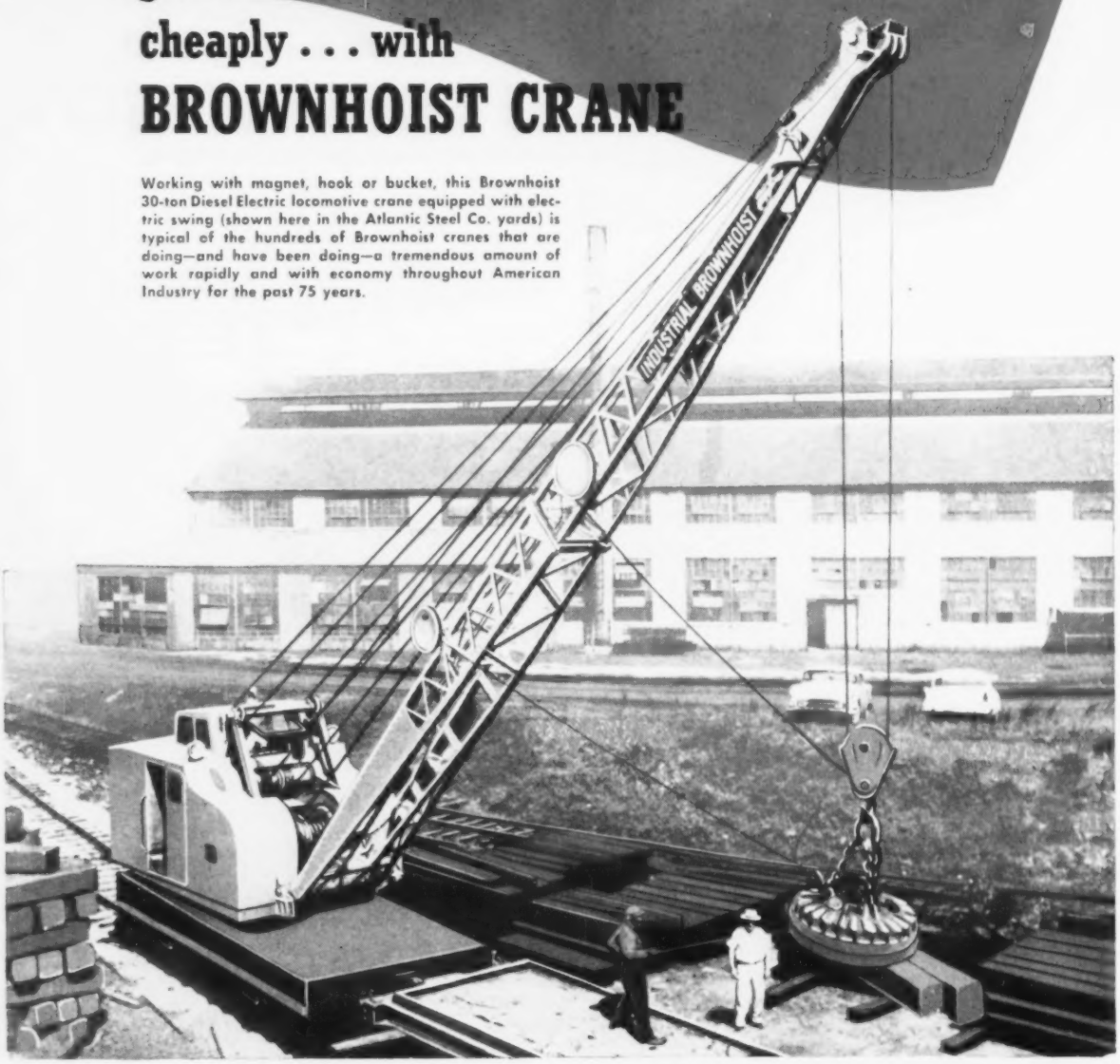
ATLANTIC STEEL CO.
gets work done fast . . . and cheaply . . . with BROWNHOIST CRANE

Working with magnet, hook or bucket, this Brownhoist 30-ton Diesel Electric locomotive crane equipped with electric swing (shown here in the Atlantic Steel Co. yards) is typical of the hundreds of Brownhoist cranes that are doing—and have been doing—a tremendous amount of work rapidly and with economy throughout American Industry for the past 75 years.



BROWNHOIST

BROWNHOIST MATERIALS HANDLING EQUIPMENT GIVES A LIFT TO AMERICAN INDUSTRY

SUBSIDIARY OF Penn-Texas CORPORATION

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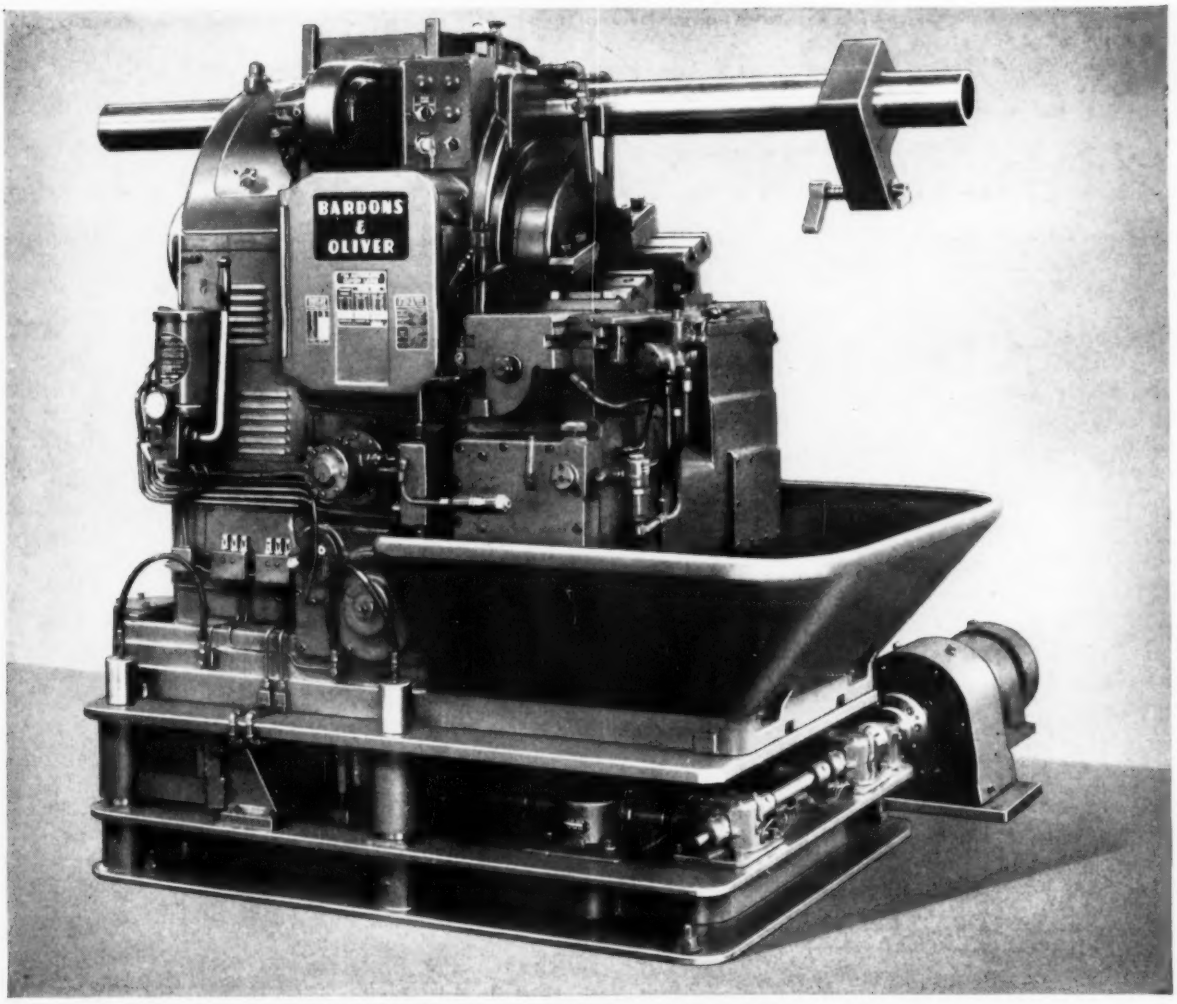


ANOTHER *Leading Steel Mill Reorders* BARDONS & OLIVER Cutting-Off Lathes

Lone Star Steel Company, Dallas, Texas, established the first electric-weld casing, tubing and line pipe mill in Texas in 1953. Their consulting engineers recommended Bardons & Oliver equipment. The fourteen Bardons & Oliver Cutting-Off Lathes purchased at that time have cropped and chamfered the entire pipe output to date and performance has been reported as entirely satisfactory.

A second purchase order for four more Bardons & Oliver Cutting-Off Lathes complete with loading tables implements a current expansion program. The first additional pair of Cutting-Off Lathes put into operation last month is producing at a higher rate than anticipated.

The illustrated No. 36 Cutting-Off Lathe is one of several used by Lone Star Steel Company. Eight sizes are available ranging in capacities from 2" to 16" diameter, in either full automatic, semi-automatic or hand operated.

BARDONS & OLIVER, INC.

1136 WEST 9TH STREET • CLEVELAND 13, OHIO

MicroRold® 430

the general utility STAINLESS STEEL

Since 430 meets military specifications, why not investigate this grade for your product

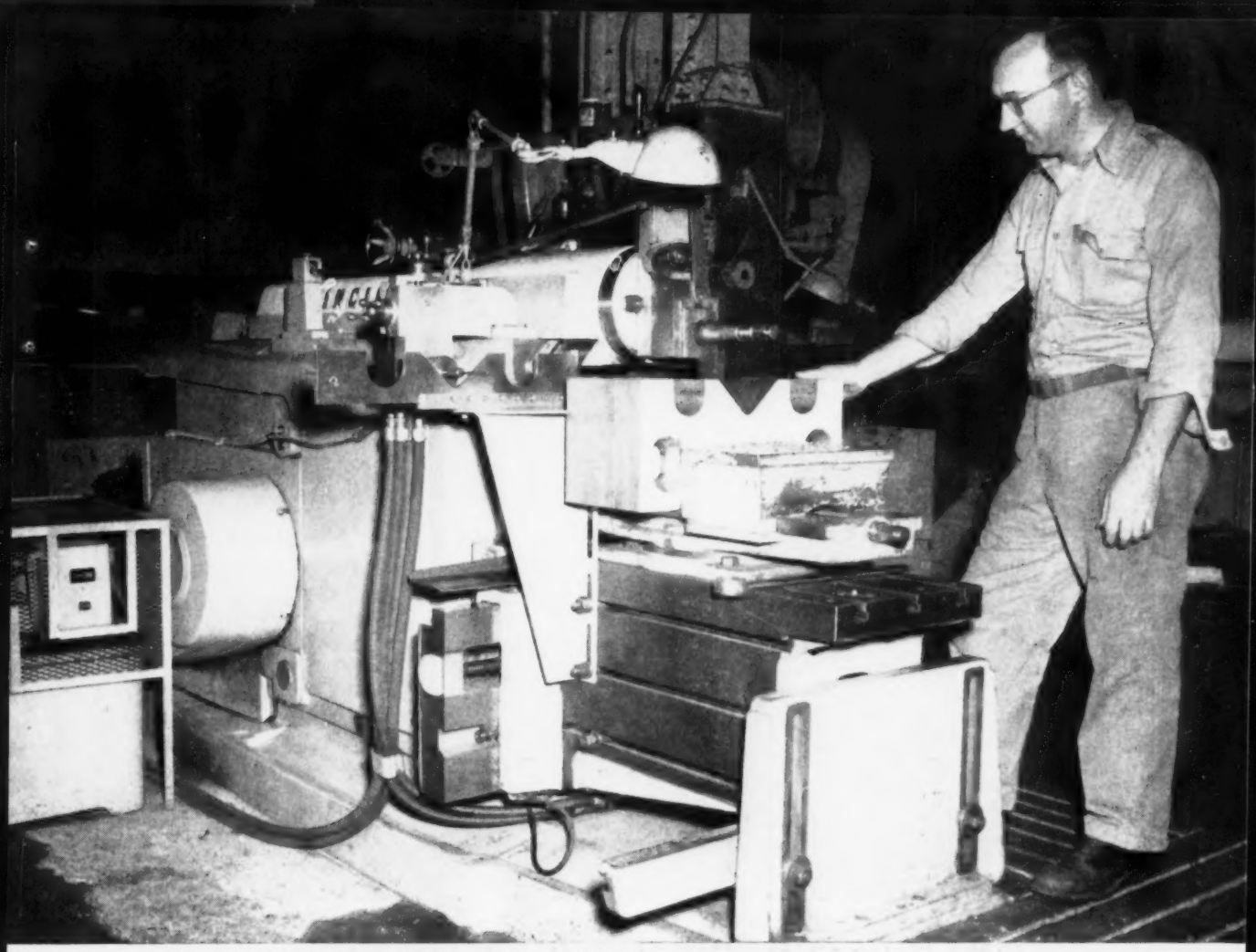
This straight chromium stainless grade possesses desirable qualities of beauty, corrosion resistance, strength, long life and low maintenance that are also of value in many civilian applications. More than 50% of all stainless applications could satisfactorily employ 430 stainless as an economical and practical material. Type 430 stainless costs 10¾ cents per pound less than the 18-8 grade. Some of our customers are already saving more than $215 per ton using our MicroRold 430 stainless sheet. Why not investigate the possibilities of this general utility 430 stainless.

Send today for your copy of our 24-page booklet, "MicroRold 430 Stainless Steel Handbook."

***MicroRold* 430 sheets** are available up to 48″ wide as thin as .010″, and up to 36″ wide as thin as .005″ in commercial finishes and tempers.

Washington Steel *Corporation*

7-L, Woodland Avenue, Washington, Pa.



Photograph courtesy of Heppenstall Company, Pittsburgh 1, Pa.

High-alloy shear knives machined on accurate Cincinnati Rigid Shaper...

at HEPPENSTALL COMPANY, Pittsburgh 1, Pa.

This Cincinnati 36" Rigid Shaper, equipped with an automatic contouring unit, is machining high-alloy steel shear knives. These knives will be used to cut 3" round-cornered squared billets and 2½" rounds, by a leading Midwestern drop-forge company.

The heavily ribbed column, extended ram bearing and slot-free ram insure minimum deflection and maximum accuracy. Exclusive Cincinnati 50 psi pressure lubrication is real insurance against wear. The Cincinnati electro-magnetic brake and clutch with finger tip control is positive and trouble free. Faster on the job . . . Easier on the operator.

Write Department B for Bulletin "Cincinnati Rigid Shapers". We also suggest you consult our Application Engineering Department regarding your machining problems.

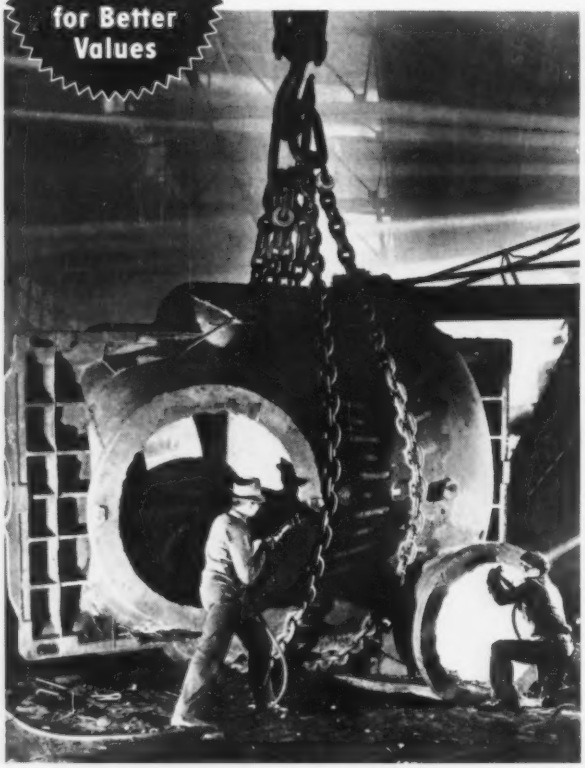
THE CINCINNATI SHAPER CO.

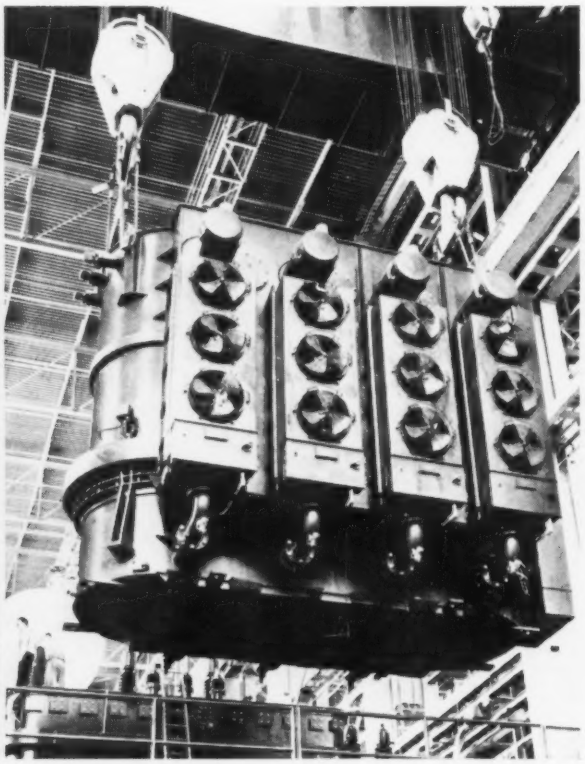
CINCINNATI 25, OHIO, U.S.A. SHAPERS · SHEARS · PRESS BRAKES

CINCINNATI

ACCO for Better Values

Acco Registered® Slings–Chain or Wire Rope





Why different loads require different slings

Your rigger knows that different loads need different slings because of varying factors such as shape, weight, material, finish, protruding sharp corners, extremes of temperature.

On some jobs chain is best. On others the characteristics of wire rope make it the first choice. On still other jobs, wise riggers know that combinations of chain and wire rope will provide the greatest lifting economy.

No matter what type is called for, you can be sure of the safest slings and the best values in ACCO *Registered* Slings. From this one source you can get unbiased information based on actual know-how.

And you can get the exact slings your rigger should have.

One of the recent improvements is the new shaped Master Link now provided without extra cost on all ACCO *Registered* Slings, chain or wire rope. This link gives 18% greater resistance to distortion with no increase in weight. It is another reason why ACCO *Registered* Slings are recognized as the standard of efficiency and safety.

All ACCO *Registered* Slings are proof-tested, registered and identified for your greater assurance of safety.

• • •

Tell your distributor you'd prefer ACCO *Registered* Slings.

WHAT "ACCO REGISTERED" MEANS

1. The best material
2. Unit safety factor (on bodies, rings, links, hooks)
3. Proof test of complete sling to twice the working load limit
4. Actual field service test of each design
5. Metal identification ring or tag on each sling
6. Signed Registry Certificate with each sling

AMERICAN CHAIN & CABLE
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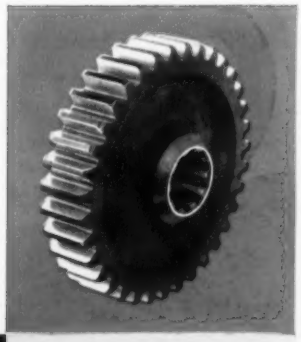
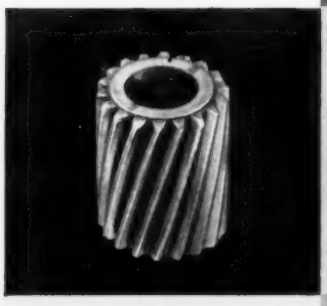
ACCO

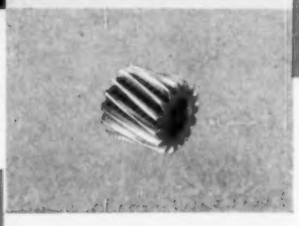
Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Wilkes-Barre, Pa., York, Pa.
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

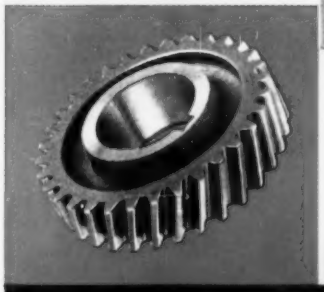


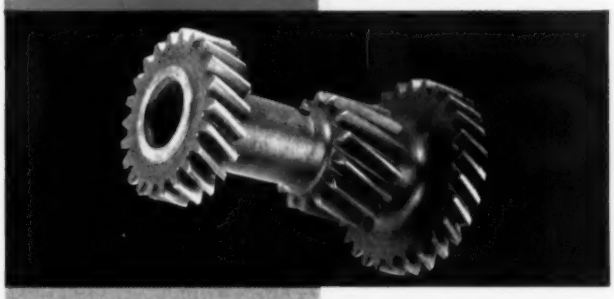
GEAR TOOTH NICKS and "HICKIES"



HONING IS THE LOW-COST WAY OF SILENCING THEM







You can hone the average automotive transmission gear in from 15 to 60 seconds. This single operation gets rid of all the noisy nicks and hickies that are so troublesome and tedious to deal with in any other way.

But that's not all. Red Ring honing also improves over-all surface finish—down to 2-4 microinches if necessary.

The initial pass under the honing tool is an effective inspection procedure in that it immediately reveals any distortions that may exist in tooth profile, spacing and pitch diameter runout. When such distortions are not excessive, honing corrects them.

If you want to reduce the cost of silencing noisy gears (1″ to 12″ PD), write for Bulletin H 57-2.

SPUR AND HELICAL GEAR SPECIALISTS
ORIGINATORS OF ROTARY SHAVING
AND ELLIPTOID TOOTH FORM

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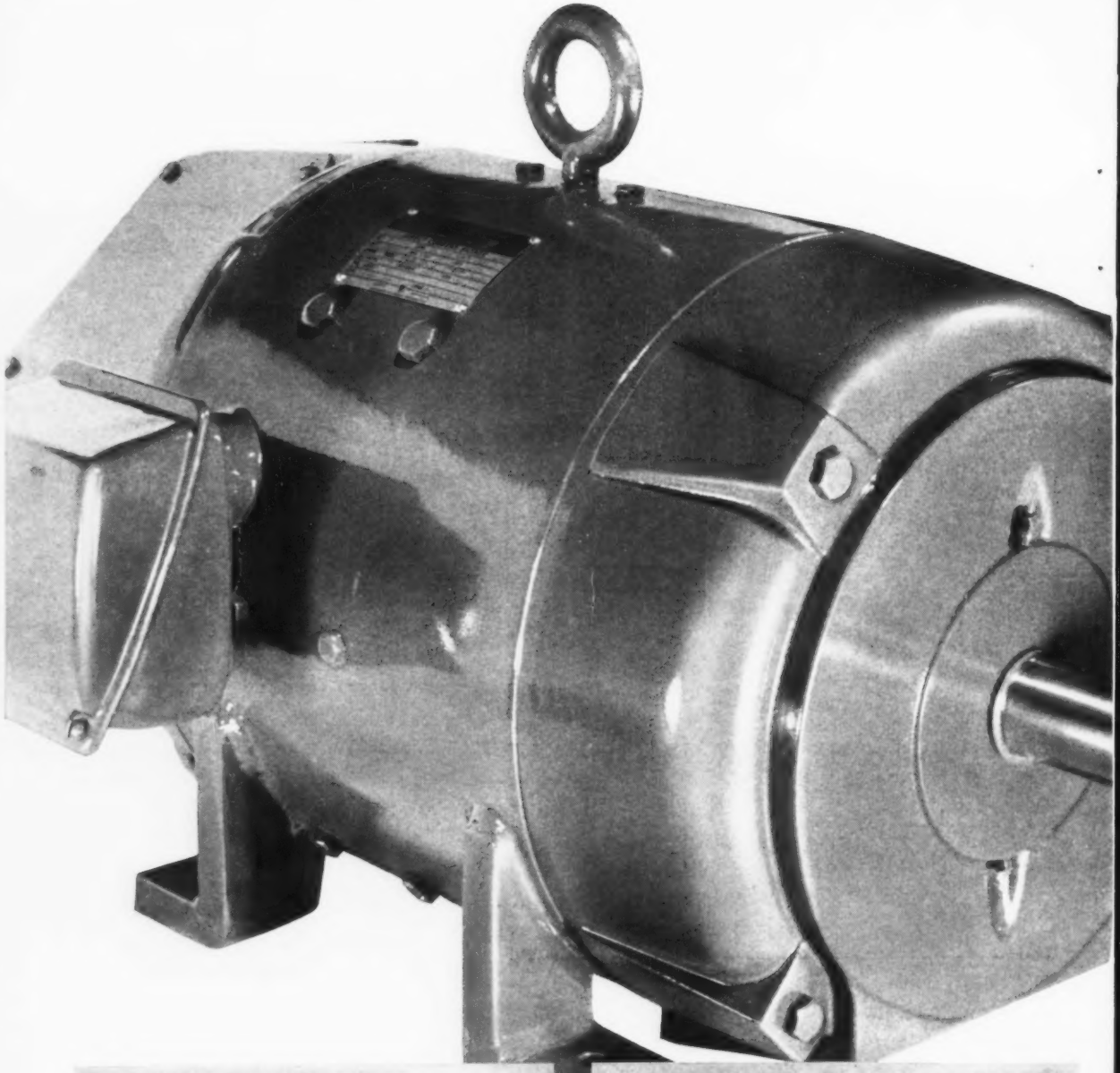
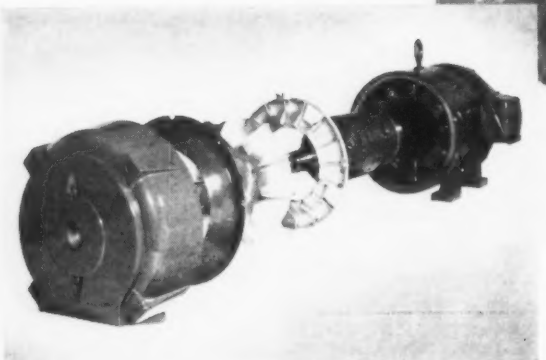
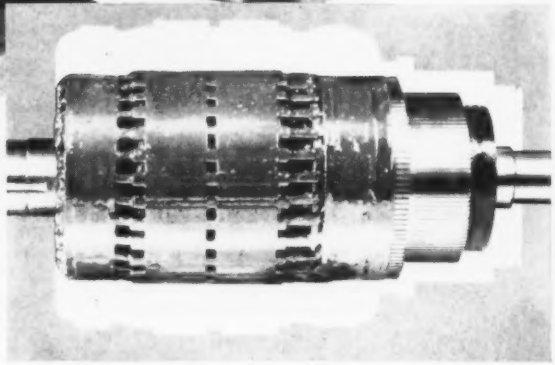
WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT





NEW CONTROLLED VENTILATION—pushes air through the motor from drive end to commutator end, opposite to the ordinary direction. Armature cooling is increased... harmful brush dust created at the commutator is blown out of the motor.



NEW LEVEL OF RESPONSE—Improved ventilation makes up to 55% lower armature inertia possible without sacrifice in capacity. Life-Line "H" gives the fastest accelerations and regulating speed changes for more and better production.

Westinghouse *Life-Line H* with silicone insulation

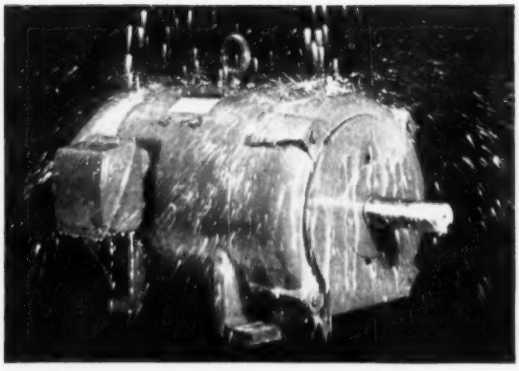
SHRUGS OFF EMERGENCY OVERLOADS . . . KEEPS STEEL PRODUCTION ROLLING

Insulation life is 10 times ordinary Class B, under any temperature conditions

With Silicone for at least 10 times longer insulation life . . . with a brand-new concept in ventilation for best cooling and cleaning . . . with greater housing protection than ever before . . . plus the highest level of response in any modern d-c machine. Westinghouse Life-Line® "H" motors and generators are tailor-made for the tough jobs and emergency conditions in steel mill operations.

Maintenance is easy, too, with the Life-Line "H". All points requiring occasional inspection and preventive maintenance have been made easily accessible.

The New Life-Line "H" offers many dividends in long-term, dependable operation and minimum maintenance. For all the facts, call your Westinghouse sales engineer. Or, write Westinghouse Electric Corporation, 3 Gateway Center, P. O. Box 868, Pittsburgh 30, Pa. Ask for B-7056. J-21991-A



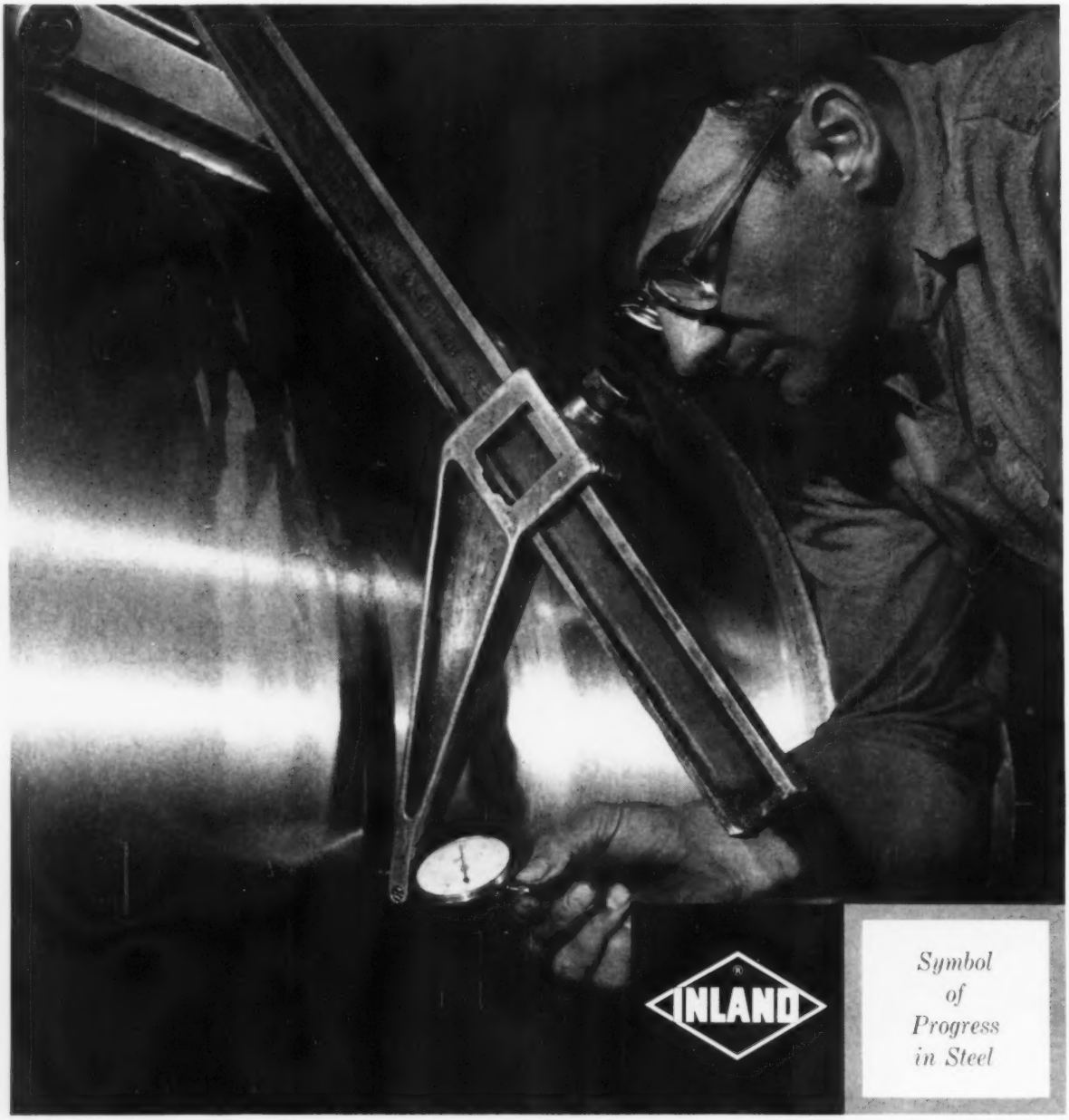
NEW HOUSING DESIGN—provides maximum protection—eliminates need for splashproof enclosures in many cases. All access openings are sealed with covers . . . single ventilation opening in each bracket faces directly down.

YOU CAN BE SURE . . . IF IT'S

Westinghouse

Hair's Breadth

Precision grinding of the rolls for the mills that process your steel is one of the key steps in maintaining product uniformity at Inland. But almost everywhere you look in the steel plants you'll see people measuring, testing, comparing, or in some way checking steel or steelmaking equipment . . . guarding the standards of uniform performance. In fact, we are constantly focusing on improving product uniformity through every phase of steel manufacture, from raw materials to finished product. This *extra* care means that the steel you get from Inland will give you the same dependable performance, time after time after time.



Symbol of Progress in Steel

INLAND STEEL COMPANY • 38 South Dearborn Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport • St. Louis • Kansas City • Indianapolis • Detroit • New York

Check Circuits In Seconds

An automatic analyzer reduces the time for checking electrical circuits. Designed primarily for aircraft testing, it can be used on virtually any multiple-circuit assembly and will test up to 1200 different electrical circuits in less than a minute. It not only detects reversed, shorted or open circuits, but determines immediately which ones are involved in any malfunctioning apparatus.

What Summer Slump?

Reports from industrial furnace producers bear a relationship to what's been happening in many consumer-goods lines. After an early second-quarter drop in new business, at least one furnace maker is selling at a rate 20 pct better than a year ago. The firm says the normal summer slump is late in arriving and may not get here at all. Outlook for summer business is much brighter than had been expected earlier.

Transmit Power A New Way

Steel balls rolling between two disks are the basic elements of a new type of power transmission unit with infinitely variable speed characteristics. The drive package is said to be more efficient and to have a wider range of output speeds than hydraulic transmissions, while rivalling the latter type in compactness. Tests to check the new device for fuel economy, performance, and ease of operation in an automobile are underway.

A-Bomb Fallout Helps Some

Radiation fallout from nuclear blasts, though widely feared, does have some scientific value. Meteorologists study it for clues to the mass air movements that shape weather patterns. U. S. scientists have the fallout from some 135 recorded blasts literally "on ice" for study. They're analyzing it where it has fallen in frozen areas near the North and South Poles.

Army Wants Aerial Jeeps

A small flying vehicle for low-altitude cruising at about 50 mph is wanted by the Army. It should be able to carry at least 1000 lb of weapons and equipment and remain airborne for several hours. A successful aerial jeep of this type might be followed by a larger, rocket-firing vehicle that would actually edge into the Air Force's close-support responsibility.

Double-Duty Mill To Bow

Look for a unique mill unit to be announced any day now. It will be a 4-high combination slabbing and plate-rolling mill. The user wants it for slabbing work primarily, but will be able to roll plates when and if the need arises. To get this flexibility, the mill will have backup rolls and will also be equipped for quick adjustment of roll separation.

Atoms To Cut Steel Costs?

A major steel producer says it's possible that atomic power may someday cut steel-making costs by heating the air that goes into blast furnaces. Use of this technique would take less coke and produce higher temperatures. "Top gases" would run turbines for generating electricity. Because it takes a ton of coal to make a ton of steel, and coal production costs have been rising, the door opens a little wider for atomic energy to show its cost-cutting potential.

Stronger Titanium Alloy

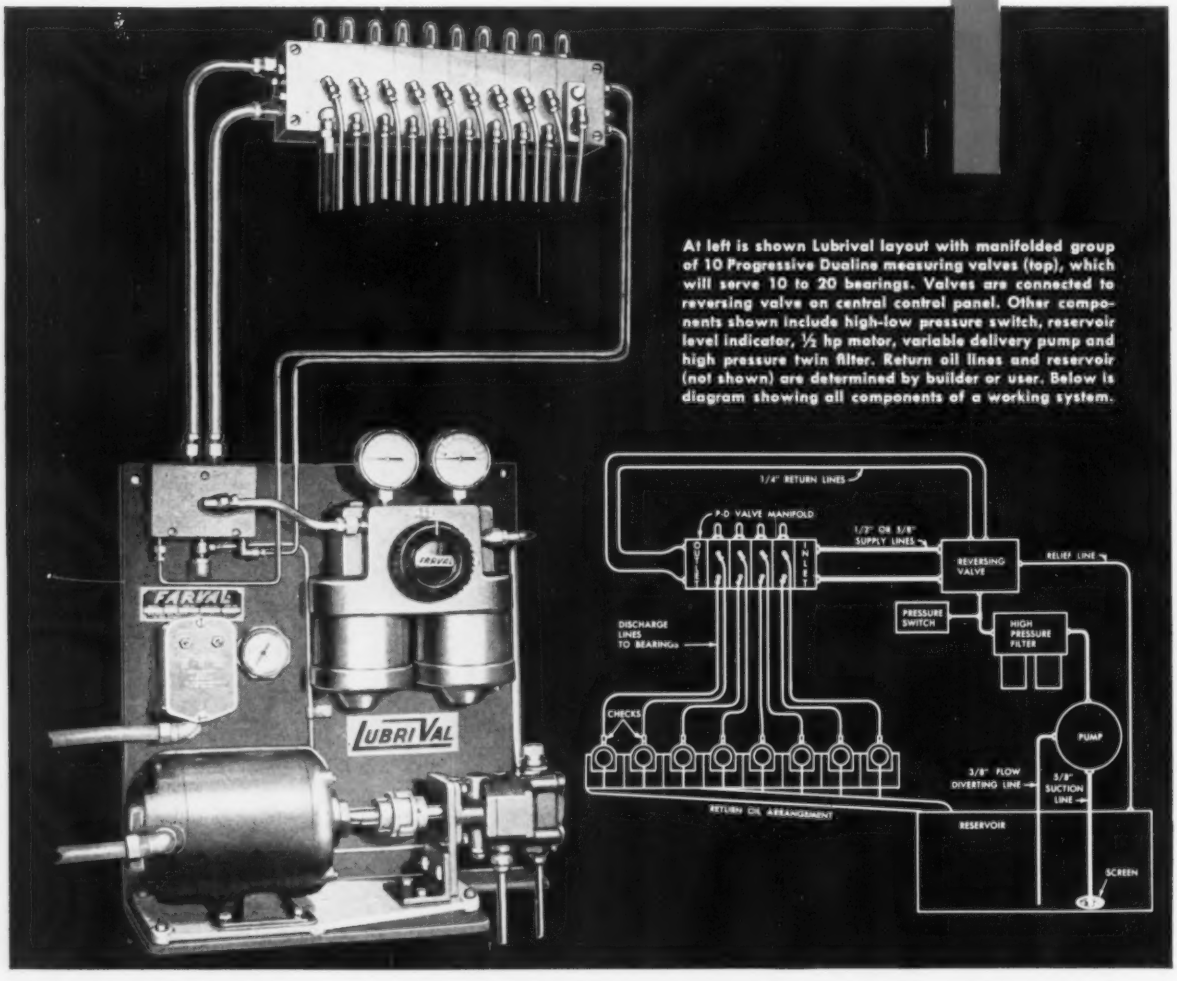
Considerable promise in high-strength applications is claimed for a new titanium alloy containing aluminum and molybdenum. As a bar and forging material, it's said to have deep hardenability, excellent heat treated properties, improved strength at elevated temperatures, and excellent time-temperature-stress-stability. Tensile strengths exceeding 160,000 psi are reported in lab tests on heat treated sections.

Fast Test on Plated Parts

Much is expected from a new test procedure for plated metal parts. Plated surfaces are made wettable by rubbing them with a paste compounded from an abrasive and specific chemicals. Subjecting the paste-coated specimen to controlled and highly-humid test atmospheres means a fast attack on the plated surface.

LUBRIVAL —a revolutionary new system to supply and circulate lubricating oil

FARVAL—
Studies in Centralized Lubrication
No. 204



At left is shown Lubrival layout with manifolded group of 10 Progressive Dualine measuring valves (top), which will serve 10 to 20 bearings. Valves are connected to reversing valve on central control panel. Other components shown include high-low pressure switch, reservoir level indicator, ½ hp motor, variable delivery pump and high pressure twin filter. Return oil lines and reservoir (not shown) are determined by builder or user. Below is diagram showing all components of a working system.

● Lubrival is designed for low volume, high pressure circulating lubrication of presses, automatic and semi-automatic machine tools and other industrial equipment designed for circulating oil systems.

Lubrival is a Farval system, employing the Dualine principle of delivering oil to measuring valves which pass it under pressure to bearings. Lubricant is force-fed by positive piston displacement. Flow can be regulated over a range of 10 ounces to 1 gallon per minute.

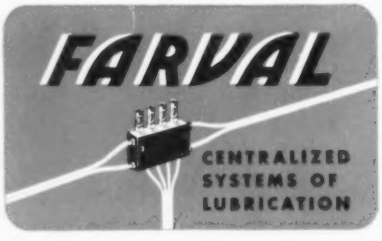
Lubrival Progressive Dualine Valves, manifolded in any number required, have individual sight indicators. A pressure sensing mechanism warns of clogged or broken lines in *any part* of the system—a feature entirely new to circulating oil systems.

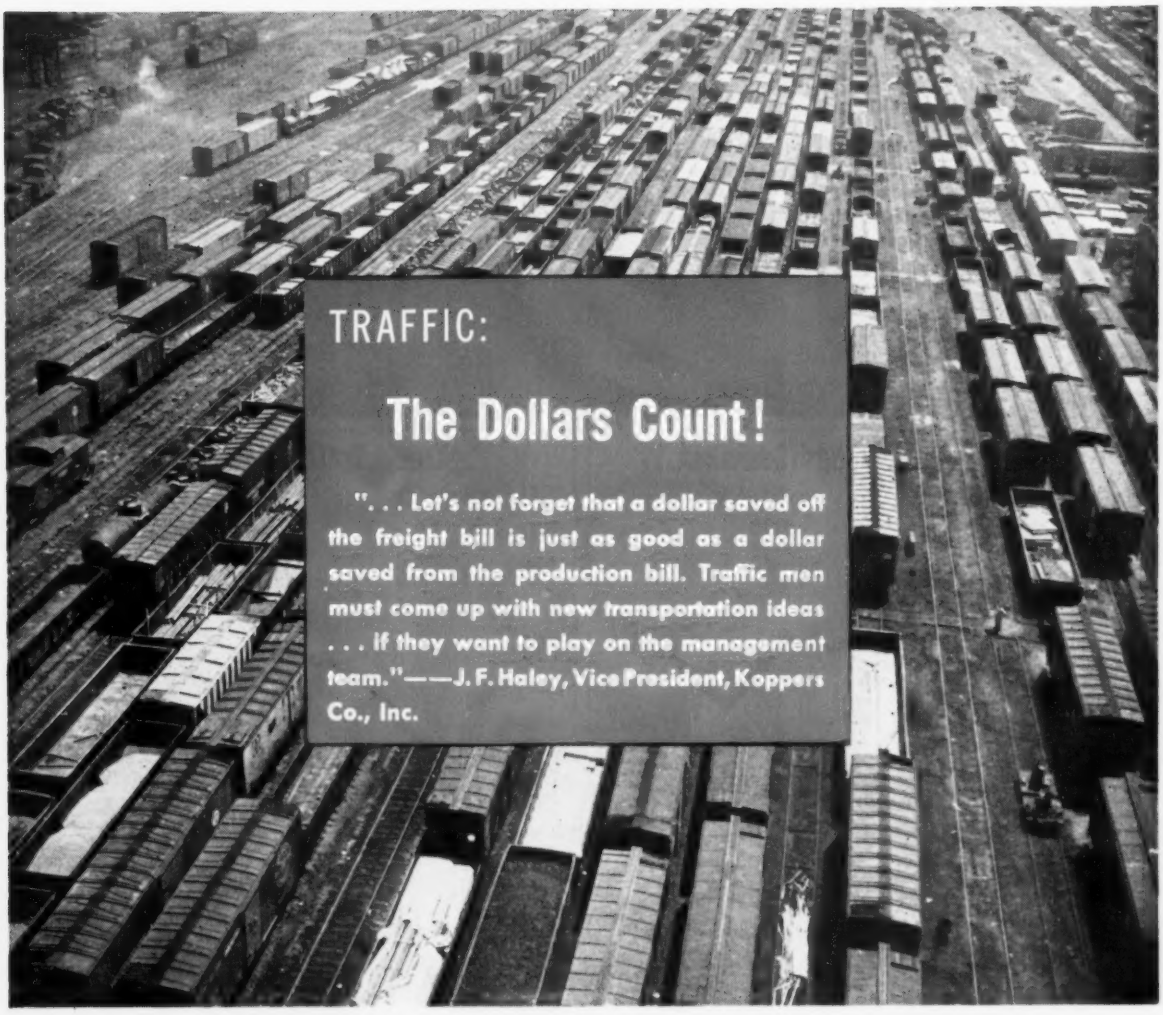
For dependable protection of bearings and economical operation of machines, look into Lubrival. If you are a builder, offer Lubrival protection to your customers. If you use presses and machine tools, specify Lubrival on your next equipment order. The Farval representative near you will give you all details. Or write for Bulletin 70. The Farval Corporation, 3282 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION—

Wherever you see the familiar Dualine valve manifolds, dual lubricant lines and central pumping station, you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.




TRAFFIC:
The Dollars Count!
". . . Let's not forget that a dollar saved off the freight bill is just as good as a dollar saved from the production bill. Traffic men must come up with new transportation ideas . . . if they want to play on the management team."——J. F. Haley, Vice President, Koppers Co., Inc.

SPECIAL REPORT

Memo To Management Traffic Planning Can Cut Costs

Rising Freight Rates Can Be Offset

Alert managements are finding cost-saving opportunities in better traffic planning. But it takes a lot of thought and planning to utilize best transportation methods.

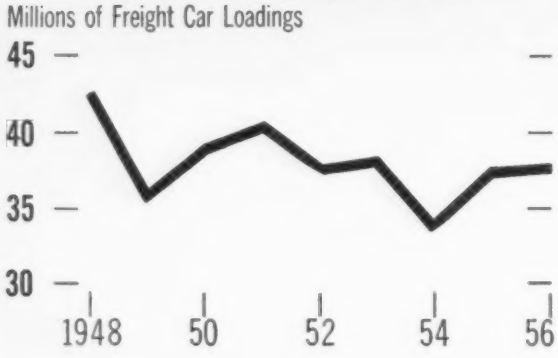
Unified approach relates traffic to purchasing, production, distribution—By G. J. McManus.

▪ Last year Koppers Company, Inc. in Pittsburgh was building a blast furnace for Great Lakes Steel in Detroit. The usual procedure would have been for Koppers to ship the major elements in sections.

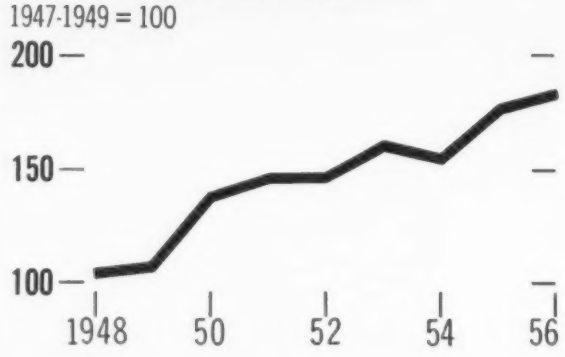
Instead the bell and hopper were built as one piece in Pittsburgh. The whole 35-ton assembly was loaded aboard a special trailer. It was moved over roads to Erie, Pa., with a six-man state trooper escort. It was loaded on a Lake boat and carried to Detroit.

The Payoff — The shipping operation cost $12,000. It would have been cheaper to move the assembly in two sections. But Koppers saved $20,000 on the over-all

While Rail Carloadings See-saw . . .



Truck Traffic Booms . . .



project through reduced fabrication costs.

This is just one example of how smart companies are saving money today through a unified approach to traffic problems. Westinghouse Electric Corp. is revamping its consumer product distribution system. Instead of shipping straight carloads directly to distributors, Westinghouse will ship to new depots. Depots will ship mixed carloads to distributors as needed.

The Combination—This method will increase transportation costs but reduce inventories and improve stock balance. Companies are not looking so much for isolated traffic savings nowadays. They want the combination of purchasing, transportation, manufacturing, and distribution that will produce the lowest over-all cost.

To come up with this combination, top management and related departments must understand the essentials. In many cases this means a fast schooling process.

The $64,000 Question—In digging into traffic, the first need is for a common language. The jumble of special terms and practices can stop an outsider cold. One authority offers a suggestion for cutting through the trade talk:

"Any new traffic project can be boiled down to dollars and cents," says traffic chief James Haley of Koppers Co. The key question, he says, is this: "Will a traffic change bring increased savings and increased profits to the company as a whole?"

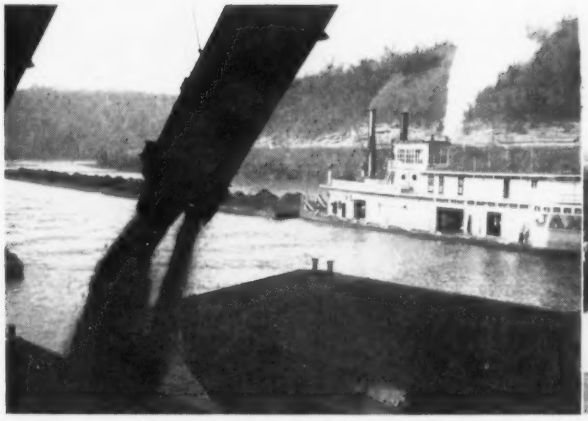
Skip The Details—Another tip: Outsiders should not try to become traffic experts. Now more than ever before, the field calls for trained, gifted specialists. The general executive should limit his studies to broad fundamentals and to important new developments.

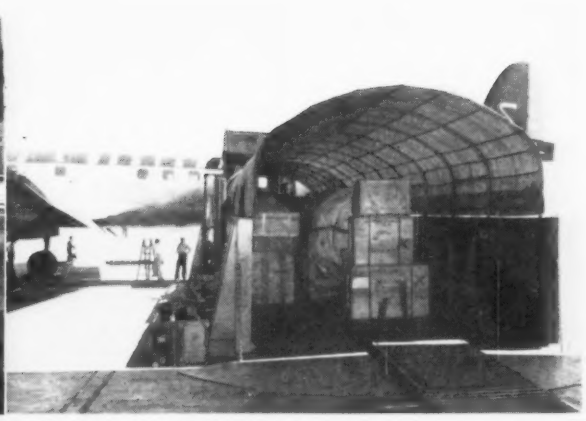
For example, he need not know exact freight rates but he should know that rate increases are due this summer. He should know that sweeping rate changes are a possibility for the near future.

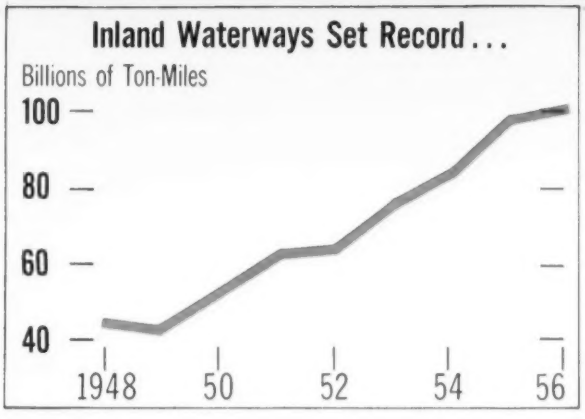
Management's Job—He should know the proper place of traffic in the company organization. He should know what areas offer chances for traffic savings. He should know when to call for help. He should be able to consider traffic suggestions fairly.

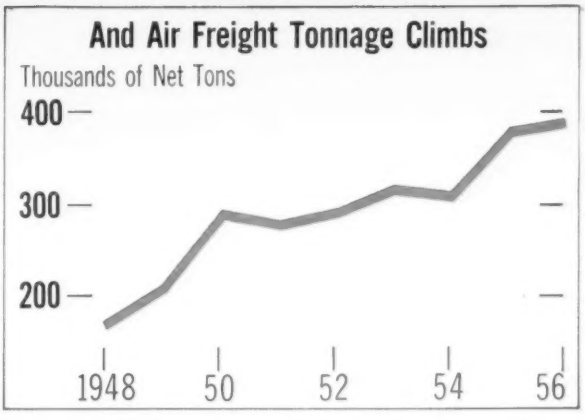
On the organizational status of traffic, most authorities lean toward an independent department with a direct line to top management. Traffic operations involve purchasing, sales, accounting and production. If the traffic department is part of any one section, there can be difficulties in resolving conflicts with other sections.

Pitfalls To Avoid — Moreover there is danger the parent department will smother traffic improvements. It may be cheaper to ship equipment in a knocked down state. The saving may outweigh added production costs. But if traffic is subordinate to production, the









move may be blocked by those interested only in direct manufacturing costs.

However, one traffic man feels it's a mistake to overemphasize organizational prominence. The important thing, he says, is that the traffic department get a fair hearing for its suggestions. Formal lines of command can vary if they provide the means for this.

Management Is Listening—In the current situation, traffic men are finding management highly receptive to new ideas. Industry's transportation costs have doubled in the past 25 years. The yearly freight bill is placed at anywhere from $30 billion to $50 billion. On past performance, industrial traffic will increase at about the same rate as national output. Freight expenditures will go up at a slightly higher rate.

Organization

Transportation hits some industries harder than others. The average manufacturer puts 5 pct of his sales dollars in freight. An integrated steel mill spends more than 40 pct of its sales dollars on transport. Others will go under 5 pct.

In almost all cases traffic offers opportunities for sizable savings. Electrical manufacturers have a relatively small percentage of their sales dollar in traffic. But between 1954 and 1956 Westinghouse Electric estimates it saved $4 million before taxes on improved traffic practices.

Research Pays — One important organizational development is the provision for specific research and development activities. The 50-man transportation group at Koppers includes a research and development section. Mr. Haley explains the need for this function this way:

". . . we found we were so busy getting our everyday wash on the line that we spent too little time preparing for the future."

The Evidence—In the first year of its existence the Koppers research group pointed out ways one division could save $100,000 a year by transportation changes. The company is looking for a handsome return on transportation research.

Ways and Means

With industry operating on reduced inventories, there has been a move toward smaller shipping lots, faster delivery, and tighter schedules.

In its small motor operation, Westinghouse Electric Corp. has met the question of short lots by consolidating shipments. A full truckload moves at a much lower rate than a partial load. Shipments are held for a short period until they can be consolidated into full loads.

Time Savers—Westinghouse has offset the consolidating time by shaving time off the order processing interval. A new teletype system shoots traffic dope to the shipping

Key question for top management: Will a traffic change bring increased savings and profits to the company?

points and permits consolidation without any over-all time loss. Also the company picks up time by the faster movement of full load shipments.

The need for tighter scheduling favors truckers, whose big advantage is service. Trucks can offer overnight service up to 300 miles. They can offer predictable delivery schedules. They offer relatively safe rides with little bracing or shielding.

Truckers Benefit—On this basis, truckers have taken over a large portion of the short haul, high rated business. Truckers haul less than 20 pct of total traffic but they pick up more than half the revenue.

Other types of transportation are sharing in the general traffic progress. Inland waterway traffic topped 100 billion ton miles last year; a 10 pct gain is expected in 1957. Barges offer low cost but relatively slow transportation. They are used mostly for heavy bulk items in lots of 200 tons or more.

Enter Air Freight—Air transportation is providing a handy means of meeting rush needs and of producing field inventories. Some time back U. S. Steel shipped a 20,000 lb shaft by air from Pittsburgh to Geneva, Utah. The speed of air shipment outweighs high costs in many situations.

A Bargaining Point—Operation of privately owned trucks has increased rapidly since World War II. Private trucks permit service that is tailored to a company's needs. They give companies an option that may be useful in talking rates with outside carriers.

However, management should study all angles before getting into the trucking business on a large scale. The move means taking on another labor union. If the haul exceeds 200 miles, return freight will probably be needed for economical operation. Private transportation is not regulated but if trucks cross state lines, log books and other records are required by the Interstate Commerce Commission.

Rates

Freight rates are in a state of explosive and complicated change. They have gone up about 120 pct in the past 10 years. Increases of 7 pct and 5 pct went in last January. The railroads seek approval of hikes that will bring the total increase to 22 pct.

The total increase will probably be around 15 pct and other carriers are expected to follow the railroads.

Demurrage Hike—New demurrage charges have been approved and are due to go into effect this summer. Under new rules, charges of $4 a day will be levied for the first four days of penalty time; $8 a day after that. Weekends and holidays will be chargeable after the first two demurrage days.

Rails Want Chance—The railroads contend they can slice rates on high value products and still make a legitimate profit. They have been restrained from doing so by ICC. The commission takes the position that without tight regulation, the railroads might adopt cutthroat rates and squeeze out competition.

In 1955 a presidential committee delivered a report that strongly endorsed the railroad position. It urged that transportation be placed on a more competitive basis with less regulation and more emphasis on costs. A bill covering these points completed hearings before a House Committee a month ago. It has not come out of committee yet and the chances of legislative action this session are slim.

Plant Location

In locating plants today, the trend is toward markets and away from raw materials. Freight rates are higher on manufactured goods than on materials.

This general concept is modified a little in the case of certain basic producers. An integrated steel mill, for example, takes in 6 to 8 tons of raw material for every ton of finished product. This fact, combined with increased reliance on imported ore, may shape the direction of future steel growth. With existing shipping facilities, the cutoff point for South American ore is about at Pittsburgh. Farther West, it is cheaper to ship ore from the Mesabi.

Study Needed—The fine points of site selection call for expert traffic study. Nearness to freight centers can make a big difference. Location on a main line near a large classification yard means faster, more dependable rail service.

Another fine point is the question of rates. One plant locating in the Southwest had its site classed as being on the freight territory border. If it had not done this before becoming committed to the site it could have found itself at a competitive disadvantage.

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Higher Wages Hit All Industry

Steel Prices Are Only Half of It

Steel price increases will force most metalworking companies to boost their prices.

Negotiated wage increases in their own back yard compound the price problem this year.

▪ Prices of most metalworking products are going up, equivalent at least to the 4 to 6 pct increase in steel prices, possibly higher according to the competitive situation.

But you can't blame it all on steel prices. Most manufacturers are facing mid-year labor cost increases of their own in addition to higher prices of steel products.

A Lot to Absorb — Even if a manufacturer absorbs some of the steel price increase, that will be only half the battle. He has higher costs of his own to contend with at the same time.

It's a tough situation for any metalworking executive. He's condemned if he does raise prices, damned if he doesn't. Chances are, most companies will do a thankless job of absorbing more increased costs than they will get credit for.

The steel industry is already feeling the needle in spite of a modest increase in prices that brought criticism from within the industry itself as inadequate.

Kefauver Is Ready — Already, Sen. Estes Kefauver, the Tennessee investigator, this week opened hearings before his antitrust and monopoly subcommittee on so-called "administered price" industries.

Initial witnesses were five economists who have, according to the Senator, specialized in administering pricing. Administered price industries are described as industries such as steel and automotive where "prices are set by administrative action of dominant firms and held constant, rather than supply and demand."

Later hearings, the Senator says, will delve into specific industries. Once again, he leaves no doubt that steel will probably be the first to come under fire. In announcing the hearings, Sen. Kefauver called attention to the recent $6 a ton steel price increases.

The probe will get under way this summer.

Tough Decision — Meanwhile, producers of steel-using products are huddled trying to decide how much of the steel price they will pass on, how much to absorb. While the loud Congressional talk may have some effect, the tight dollar squeeze many find themselves in will have the final word.

Looking at some individual industries, General Electric Corp. has no company-wide policy—as yet. Price adjustments will be left to managers of product lines who

What to Expect in Price Increases

▪ Auto Industry—Prices of 1958 cars will not be set until just before new models are introduced. Steel prices are only one factor in pricing of a new car. Auto industry's own labor costs are going up. Best bet: Prices will go up, but disguised in "greater value for advanced styling and engineering."

Farm Equipment — The base steel price will be added to by a general labor cost increase in the third quarter. Prices will probably go up about 5 pct, possibly more, if present sales rate continues.

Machine Tools—It's a safe guess that tools will cost more, but steel prices will probably be only part of the reason. Quote: "Steel prices aren't the only thing that's gone up by a long shot."

Warehouses—General increases of $8 to $9 per ton for steel can be expected. Smaller warehouses indicate they'll follow basic steel's lead of $6 per ton average. But it won't work out that way. They will follow the lead of larger warehouses, so the same pattern of $8 to $9 can be expected.

Stampers—Large stampings will carry more of the advance than small stampings. Competition will set the pattern here, with more competitive small stampings probably assuming some increase.

Appliances—No rule of thumb. Most appliance makers have already increased some prices in advance of steel price increases and in anticipation of cost increases in their own plants. More selected price increases can be expected.

presumably will base their prices on competitive factors.

On the other hand, fastener maker Russell, Burdsall & Ward will pass on the steel price directly, and expects its competitors to do the same.

Hard Time to Act—Many metalworkers are still vague about the final price decision. Business this summer is soft enough in many lines to make price boosts a tricky proposition no matter how strong the pressure.

Consumers Keep Pace — There is some moderate concern as to whether consumer spending will be able to keep pace with new, higher prices for consumers' goods. Most consumer durable goods makers hope that purchasing power, through higher wages, will about keep up to new prices, and thus not hurt the level of unit buying.

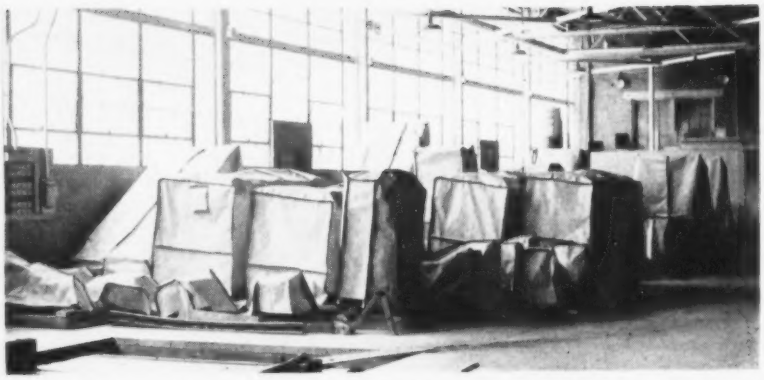
Machine Tools Up — Machine tool builders are careful about predictions, but some make no bones about their feelings that prices should have gone up some time ago.

"It's a safe guess that tools will cost more, but steel prices will probably be only part of the reason," one builder says. He could be speaking for metalworking generally when he says that "steel isn't the only thing that's gone up recently by a long shot."

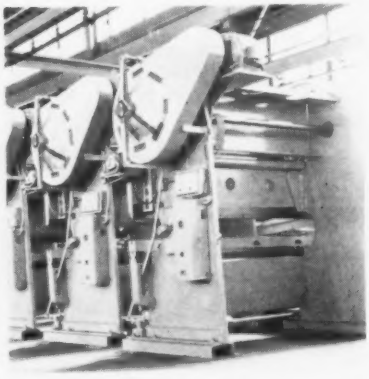
In the highly competitive farm equipment field, where a moderate increase from recent bad years is the most to be hoped for, reaction is one of resignation.

No Alternative — The industry has already got the steel price increase and will have a labor cost increase of its own in the third quarter. Best guess is a 5 pct increase.

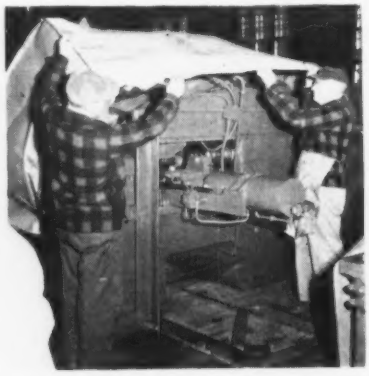
Automotive Factor — An automotive supplier, possibly optimistic, says: "We have always found the auto industry very fair about accepting higher prices when new labor and wage costs warranted them."



AVAILABLE WHEN NEEDED: Machine tools used in production of light tanks are carefully protected from deterioration at ACF plant in Berwick, Pa. Equipment can be made ready for use in a few days, if need arises.



GOOD AS NEW: Painted, oiled, and vital gears covered, these press brakes are ready for dust shields.



INSPECTION: Maintenance crew raises dust shield on equipment to check for rust, peeled paint, dirt.

Machine Tool Layaway

Time has proved the best way to preserve machine tools for long periods.

After nearly four years, the Ordnance Corps has its answer. —By R. O. Schulin.

▪ In factory bays throughout the U. S., more than $4 billion in machine tools are being stored for possible use in a national emergency. As part of the Ordnance Corps' "layaway program," they represent a monumental achievement in machine storaging, maintenance, and record-keeping.

The effort is considered well worth it by Ordnance officials, both from an economy and preparedness standpoint. Within a few weeks the stored tools could be ready for partial production. And within two months, U. S. ordnance production could be in full swing. The Army wants to avoid a recurrence of the Korean War tooling scramble.

Low Upkeep — The Ordnance Corps has set a limit for maintenance costs at 5 pct of replacement value. Currently, maintenance costs are running at a little over 2 pct.

Since the layaway plan was first begun nearly four years ago, the Ordnance Corps and its prime contractors have been working to de-

PAINTING: Welding rollover fixtures for tank hulls get coat of paint as final step in layway process.

DISASSEMBLY AREA: Heavy machinery is dismantled and parts stored in space-saving crates. Machine bases, in rear, will get final coat of paint, a preservative, and covered with heavy paper dust shields.

DIE STORAGE: Fully reconditioned dies, used for light tank production during Korean conflict, are laid away. The Ordnance Corps has $4 billion in tools standing by that can be ready for production in 60 days.

Program

vise the safest and most economical means for storing machinery.

ACF Program—At ACF Industries, Inc., plant, Berwick, Pa.—one of the first to be selected for the layaway program—a standard packaging procedure was recently okayed by the Ordnance Corps after years of experimenting. The ACF method proved safe, simple, and economical.

Here is how ACF does it:

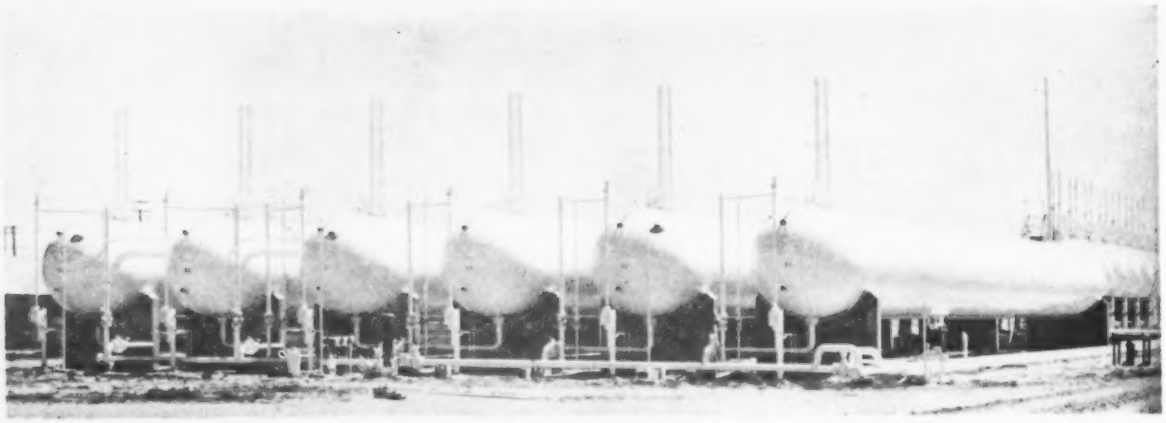
Machines are cycled, flushed and drained; motors and pumps disassembled, cleaned and preserved. In the cleaning process, the entire machine is sprayed with a solvent. Machine bases and housings are painted completely. On machined surfaces, all rust is removed, and a fingerprint neutralizer applied. Then a heavy preservative grease is sprayed on.

Paper Tarpaulins—Now ready for packaging, motor openings are sealed with "C" paper, a wax-treated scrim cloth. Preserved surfaces are covered with "A" paper, another variety of wax-treated paper. As a final protective measure, the machine is covered with a dust shield made of E-3 barrier paper, an asphalt impregnated paper. The paper is folded along the contours of the machine and stapled. A pressure-sensitive tape is used to seal seams and inspection "windows."

A two-man inspection team makes a continual check of the 12,000 items stored at ACF. Each item gets examined about every five or six months. Under this system, ACF maintains $50 million worth of government equipment at an annual cost of about $18,000.

Up-to-Date Records — A vital phase of the layaway program is record-keeping. To keep tight inventory control on all 12,000 items, ACF uses the Standard Commodity Code. A four-copy system, the records include location of equipment in the plant, machine history, and a photo of the machine assembled ready for use.

It took ACF six months to tool up for light tank production in 1950. It should take less than 90 days to do it again.



SIX OF A KIND: L-P tanks like this Phillips Petroleum group dot the U. S. landscape.

L-P Tank Makers Sad But Hopeful

Liquefied petroleum gas sales head for new high, but tank market off 15-20 pct.

Tight money, sagging home market hit producers. Yet long-range potential is good.

▪ The heavy steel tanks that hold liquefied petroleum gas dot the countryside, have pushed into the cities, even ride the highways. The fuel they carry is still rising in demand. But for the tank makers themselves, there are storm warnings ahead.

Over 110,000 lift trucks, tractors, stationary engines, and other power plants were converted to L-P fuel mixtures in 1956. Total sales of L-P gas hit a record 6.9 billion gallons in 1956, should reach 7.4 billion gallons this year. Yet tank sales are off 15-20 pct.

Distributors Hurt—Tank fabricators have little hope that the industry will hit the record 265,695 tanks shipped in 1956. Even though a second-half comeback is looked for, tank makers generally expect to use less plate this year—and for several strong reasons.

One major problem is the credit shortage. Tank distributors are hardest hit, at a time when they need credit most. Many metropolitan distributors are accumulating inventories of used tanks from areas now served by gas. The Liquefied Petroleum Gas Assn. is trying to help by educating investment houses on the advantages of loans to L-P distributors.

Home Market Sags—The critical home fuel market also is in the doldrums. This major outlet has been hit by (1) tight money, (2) buildup of used tanks in dealer inventories, (3) the drop in housing starts, and (4) increasing inroads by the electrical industry, which has been running an all-out promotional drive.

But the news is not all bad. Small tanks of less than 110-gallon capacity are moving well. Vehicle conversions which have exceeded 100,000 per year for the last two years have boosted demand for small, heavy duty tanks of carbon and alloy plate in narrow widths.

Strong Potential — Here's the statistical story on small tanks: After dipping to 1860 units annually in 1947 when home owners began to switch to larger tanks for home fuel storage, shipments rose to 19,000 per year in 1953-54, zoomed to 42,000 in 1955, and probably bettered that in '56.

The tank makers can also count on a continuing demand because of the growing propane-butane market. Propane injection into oil fields for crude oil recovery is a comer. Two such projects will require 82 million gallons of propane in the next two years. The L-P truck engine, the L-P in-the-wall furnace, the L-P-burning stationary engine, improved L-P distribution through the growing tank truck fleet, argue for a strong growth potential.

Gloomy Thoughts — But meanwhile, the tank makers are thinking gloomily about their '57 market. "Well, what are you diversifying into?" is one of the stock greetings when tank men get together these days.

Stainless Steel

Washington Steel Corp., Washington, Pa., will spend $1 million to expand its stainless steel sheet and strip facilities. The project includes enlarging the shipping dept., a new carpenter shop, a new 48 in. continuous strip grinder, roll grinder, air compressor, 18 in. slitting line, re-square shears and a new acid disposal plant.

All three continuous strand annealing and pickling lines wll be lengthened.

Adhesives Aim at Metalworking

Can They Meet Automation Requirements?

Metal-to-metal applications work out well in the lab, with imposing results to point to.

New uses in auto and appliance fields are coming. Manufacturing speed imposes a big problem.

■ Adhesives for metal bonding may be but a dot on the metalworking horizon. But a number of the major firms are making big plans to explore the territory and develop its possibilities.

The Reichhold Chemical Corp. in Detroit plunged into the epoxy resin field last year. Minnesota Mining & Manufacuring, and Chrysler Corp., both metal bonding adhesive producers, are grooming their sales force for a wider market in 1958.

B. F. Goodrich is introducing a new, higher strength adhesive and is strengthening its sales force for more sales. General Mills expects an increase in automotive metal-to-metal adhesive bonding next year, to name a few examples.

Strength Properties—At the moment, epoxy resins have a production edge. The new resins hold at 500° F operating temperatures and this range is rising. Strengths over 1000 psi at that temperature are reported. Special curing boosts tensile strengths another 500 to 800 psi.

Ceramic adhesives are just coming. These bond metals to metals at temperatures of 1000° F. After 500 hours of testing, a ceramic bonded stainless steel strip held at 600 psi in 600° F temperatures.

Test bonds in 302 stainless and 17-7 precipitation-hardened stainless proved the bond held at temperatures at which the base metal lost its hardness properties. Researchers believe that ceramic bonds will withstand 2000° F.

Markets Are Developing—Adhesive bonded metal joints are stronger than many metalworkers are inclined to take for granted, although some are using adhesives on the production line.

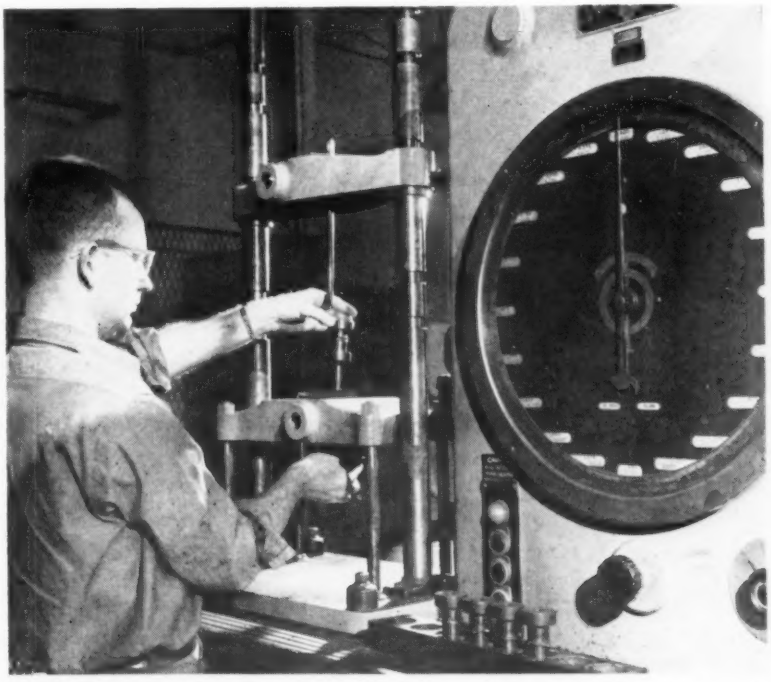
American Can Co. bonds all of its motor oil cans, all of its detergent cans, and most of its frozen fruit juice cans. Southern Casting uses epoxy resins mixed with aluminum powder to patch aluminum castings and epoxy resins to cement in gates.

A machine tool builder now cements cams to a shaft. The new method cuts rejects caused by minute distortions from heat used in a previous process. An automotive company has experimentally bonded the hydraulic transmission parts to the drive shaft. This is seriously considered for assembly line production.

1958 Auto Possibilities — Thin stainless sheets, adhesive bonded to cold-rolled carbon sheet, for drawing into bumpers and hub caps, may be coming in with some 1958 models. One major producer uses epoxy resins as a body solder replacement to build up low spots in body panels.

Some Drawbacks — Adhesives producers will develop the metal-to metal market with slow care.

Big obstacles are the high degree of automation obtainable from most other joining techniques, surface penetration required before surface is ready for plastic bonding, and curing time for plastic bonds.



TESTING: B. F. Goodrich adhesive is used in automotive and aircraft metal-to-metal bonding. Standard acceptance test is 4000 psi as adhesive is tested between test buttons of a tensile testing machine.

Zinc, Lead Will Go It Alone

Congress plagued by logjam of bills. New look in barter program puts CCC in untenable position.

▪ If the domestic lead and zinc industry really needs help, it will probably have to help itself. There'll be no assistance from Washington this year. That's the opinion being heard more and more in government corridors.

Too Many Bills — Congress is up to its ears in bills. An assistant to a member of the Senate Interior Committee says it looks like Congressmen are writing bills to cover all conceivable possibilities. All of the tremendous number of bills have some opposition. And none has yet won enough support to suggest passage. Several bills call for production bonuses, are opposed by industry.

Most of the bills call for higher tariffs. Sliding scale tariffs, requested by the Administration, are called too low by producers. A bill calling for a 6¢ tariff when lead drops below 18¢, zinc below 15¢, is opposed by consumers.

Bills providing for import quotas are opposed by the State Dept.

No Help Expected—Some long-range bills calling for more exploration for richer, more economical ore bodies are hitting minimum organized resistance, but could have little effect for years.

Best bet, say Washington insiders, is that no legislaton for immediate assistance for domestic lead and zinc will even reach the floor this session. If any bills do get out of committee, it's unlikely the House and Senate will agree. If any bill does come through, it will probably be the Administration's sliding scale tariff program.

New Look No Help — Things are pretty quiet over at Commodity Credit Corp. these days. The new look in the barter program has fewer contractors waiting to do business with the government.

Two new policies are causing most of the trouble. Contractors now must prove that deals they make for surplus products do not replace dollar sales. In other words, the transaction would not have taken place except for barter. There is nothing in the barter law or precedent to indicate what constitutes proof. And no one seems to know what the CCC will accept, including CCC management.

CCC Price High — Contractors may still draw surplus farm products in advance of delivery of the foreign material traded for. But under the new interpretation of the barter plan they must pay interest until the arrival of the foreign goods. Charles Crofton, Crofton Grain Co., N. Y., told a Senate Committee that the immediate use of the farm products, without interest, was the big advantage of dealing with the government. Crofton insisted the CCC price was usually too high, pointing out that on a recent deal with Brazil, 250,000 tons of wheat cost 6¢ more per bushel than on the open market.

Most close observers expect a gradual loosening of the restrictions hampering barter, quietly and from within.

U. S. membership in General Agreement on Tariffs and Trade permits the State Dept. to negotiate for higher zinc and lead tariffs, without waiting for Congress. But this is unlikely.

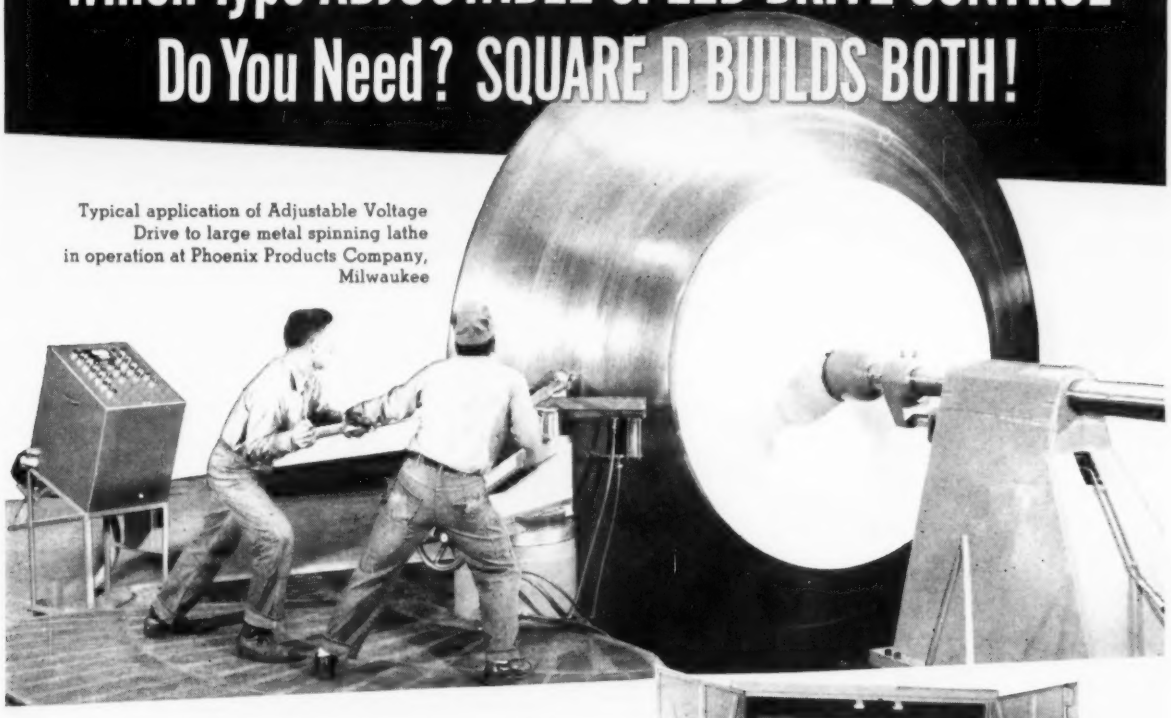
State Will Wait — Word is that the State Dept. will wait for Congress to make up its mind, then negotiate for the necessary changes under GATT Article 28.

Congressional Logjam for Lead, Zinc

All these bills have been introduced to Congress, aimed at least in part to help domestic lead and zinc producers.

BILL NUMBER	CALLS FOR:
H. R. 8257 H. R. 8265 H. R. 8303 H. R. 8307 H. R. 8328 S. 2376 H. R. 8464	**Seven identical bills calling for sliding scale tariffs on lead and zinc and their products. No tariff if lead is over 17¢ or zinc over 14.5¢. This measure is backed by Administration.**
H. R. 8336	**Lead tax on importer equal to difference between U. S. price and 18¢.**
H. R. 8337	**Zinc tax on importer equal to difference between U. S. price and 15¢.**
S. 2271	**6¢ duty when lead falls below 18¢, zinc below 15¢.**
H. R. 8272	**Production bonus, equal to difference between price received and last price paid by the government for lead and zinc.**
H. R. 8368 S. 2395	**Production bonus, equal to difference between price received and 18¢ for lead, 15¢ for zinc.**
H. R. 8189	**Tax relief—New critical metal production not taxed for first five years.**
H. R. 8258 S. 2375	**Financial assistance to stimulate mineral exploration.**

Which Type ADJUSTABLE SPEED DRIVE CONTROL Do You Need? SQUARE D BUILDS BOTH!



Typical application of Adjustable Voltage Drive to large metal spinning lathe in operation at Phoenix Products Company, Milwaukee

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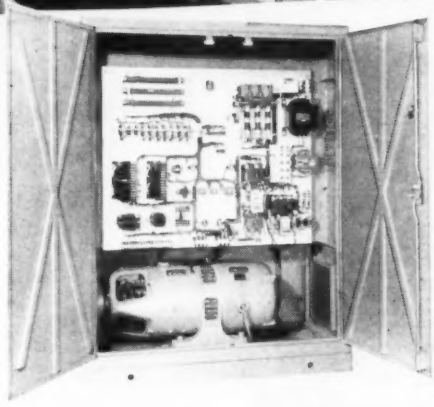

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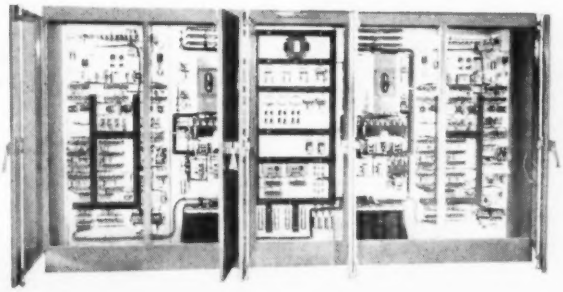

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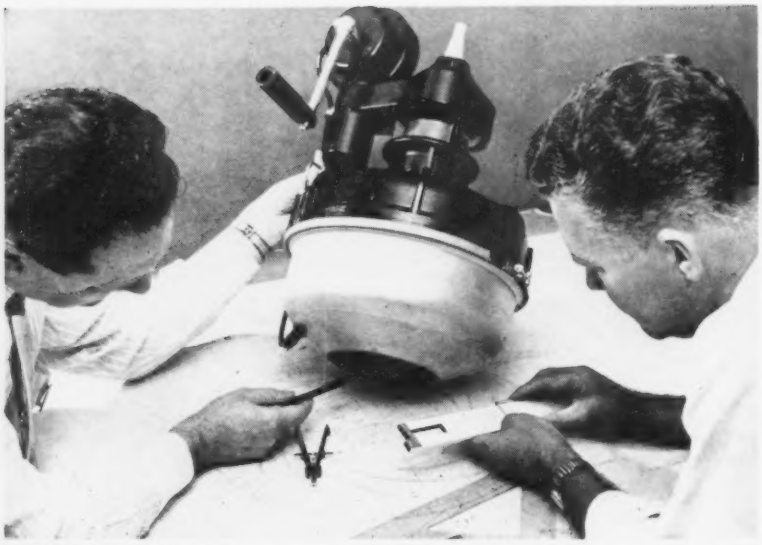
SQUARE D COMPANY



MERCURY: Solar Mercury, military designation YT-62, is called world's smallest gas turbine aircraft engine by maker, Solar Aircraft Co., San Diego. Designed and built under a joint Navy Bureau of Aeronautics and U. S. Army contract, it will be used to power one-man helicopters.

ODM Closes Tax-Am Door On Four More

The once broad fast tax amortization program is now available only to certain direct defense industries.

Office of Defense Mobilization shut off four more expansion goals; nickel, steam turbines, steel castings, and mica substitutes. Still open are research and development laboratories for direct defense; production facilities for military and Atomic Energy Commission procurement; and liquid oxygen and liquid nitrogen for defense use.

Under Fire—The move was expected for some time. Criticism of the tax amortization program from Congressional leaders and fiscal experts has been strong in recent months.

Of some 279 pending applications for tax writeoffs, only five are under the newly closed goals. One was for a nickel project costing about $13.9 million. It was rejected but the other four will be considered.

Passed Original Goal — ODM notes that in the case of nickel, the original goal of 440 million lb of annual production will be exceeded slightly when presently planned capacity comes into production. Indications are, the government says, that capacity by 1961 will hit 450 million lb.

The steel castings and steam turbine goals were closed because of anticipated reductions in the defense needs for these products, ODM says. The steel casting goal originally provided for an expansion of 500,000 net tons of annual capacity. Facilities now built or planned will meet 90 pct of the goal.

New Techniques—Technical developments of gas turbines and diesels have reduced the need for steam turbines. Combined with a program under which the government is buying standby equipment for making steam turbines further expansion is unnecessary, the agency says.

Bethlehem Ace-in-Hole

Bethlehem Steel Co. has an ace-in-the-hole should it be unable to break into the Midwestern market through its proposed merger with Youngstown Sheet & Tube Co.

It was learned this week that Bethlehem is surveying a 3500-acre site at Burnt Creek, Ind., near Gary. While the company declined comment on the tract's significance, it was apparent that it could be developed as a site for a new steel plant.

Observers believe Bethlehem bought the tract as a hedge in the event its proposed merger with Youngstown is defeated by the Justice Dept.

The Bethlehem activity came to light when company representatives testified at a hearing on a proposal by towns in the area to zone out heavy industry. The company admitted it was surveying the tract.

Option On Coal Land

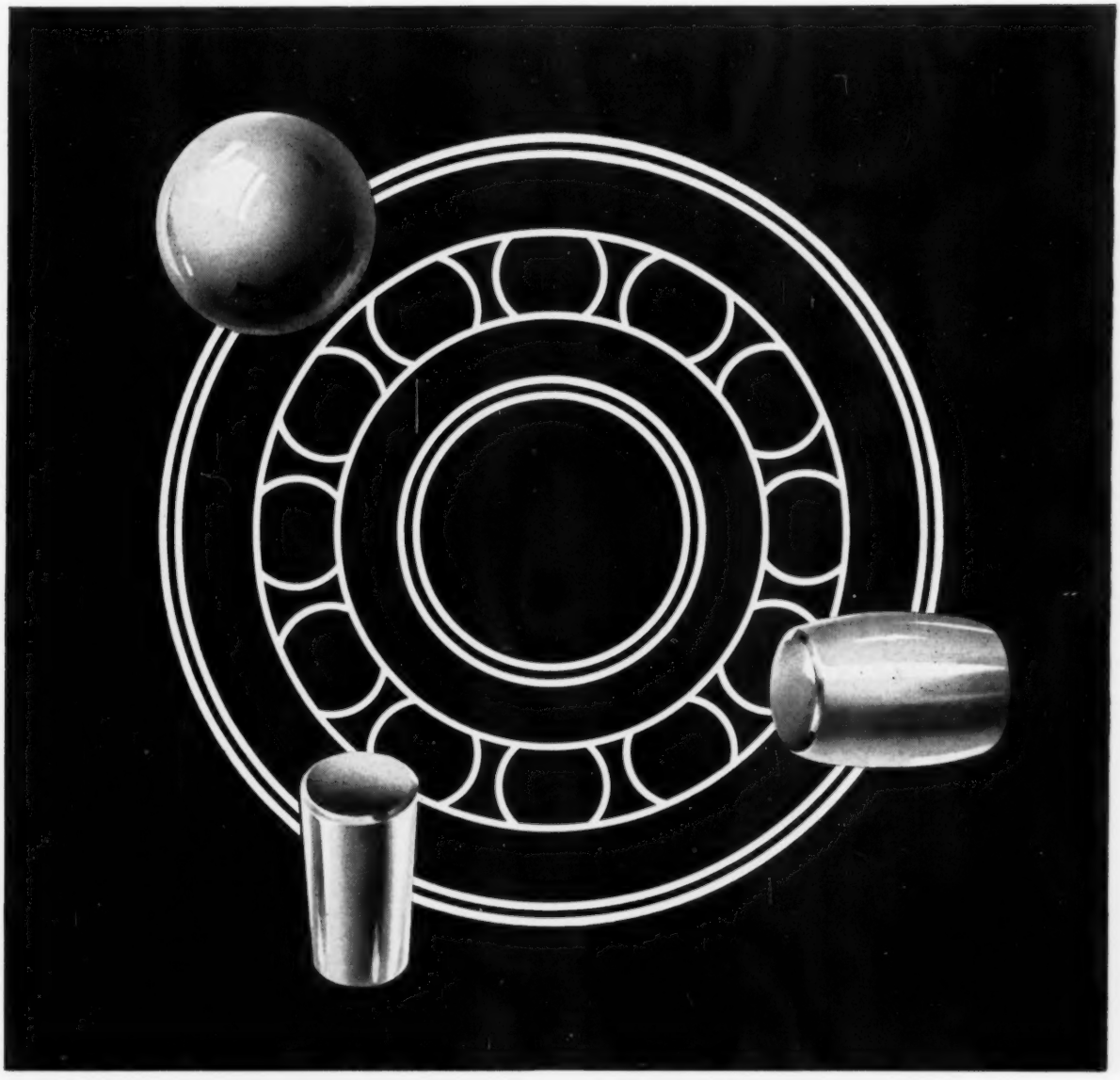
Barium Steel Corp., N. Y., has acquired an option to lease 5700 acres of coal land in western Pennsylvania from the Pennsylvania Railroad.

The move was called "an important step in Barium's program to expand its production facilities on its newly acquired 900 acre site on the Delaware River," by Barium president J. A. Sisto.

More Venezuelan Steel

The Venezuelan government recently signed an agreement with Innocenti, S. G., Milan, Italy, prime contractor to boost initial annual ingot capacity of a new steel mill under construction from 464,000 to 770,000 net tons. Increase raised dollar value of the project from $200 million to $343 million. First steel from the new mill is slated for first half 1958, with full output set for 1960. Seamless pipe mill will be the first unit to go into operation, using imported billets until the plant can produce its own.

Output—Importance of the oil industry to Venezuela is emphasized by the priority given to seamless pipe. About half the new plant's capacity will go directly to petroleum producers.



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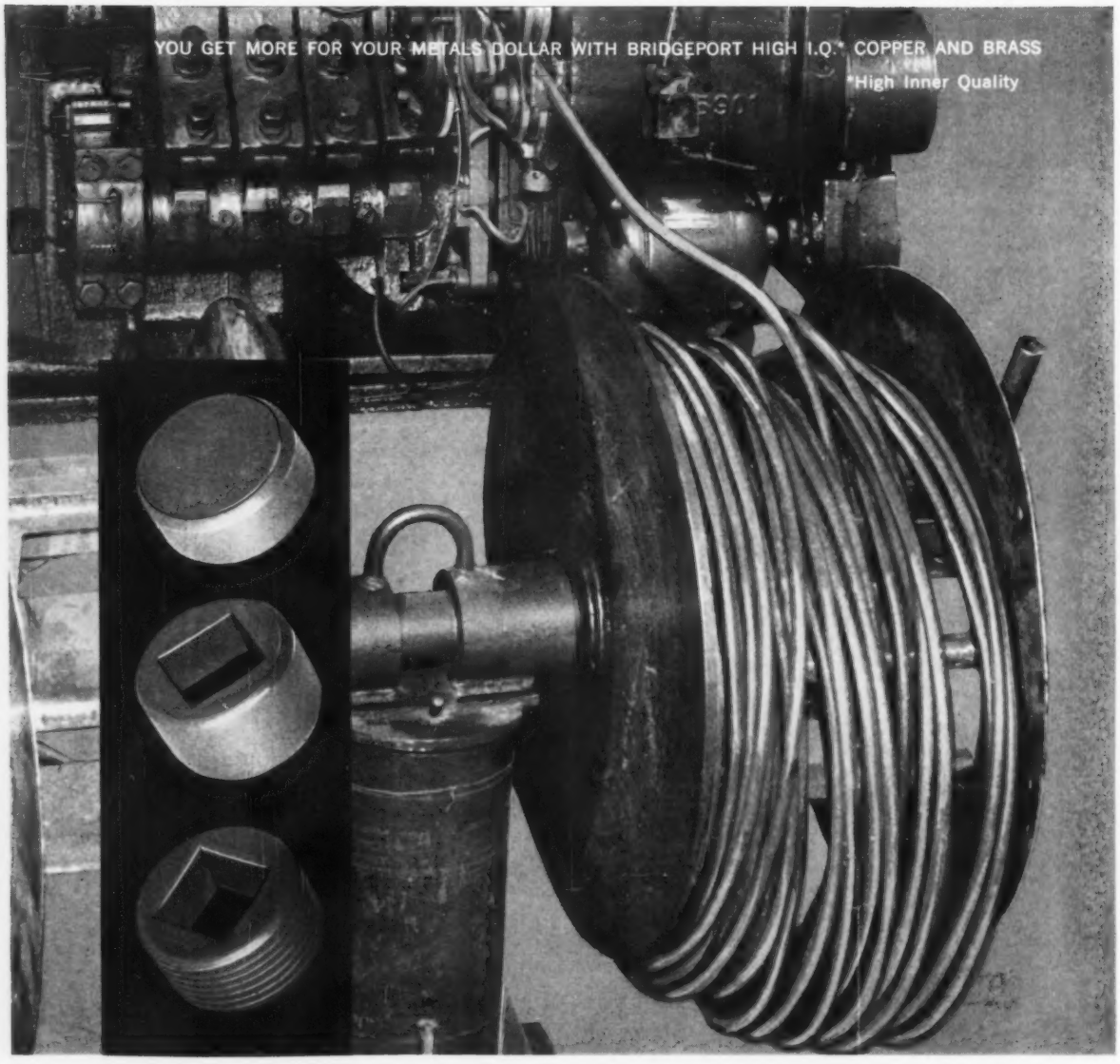

Progressive steps in the manufacture of a Pittsburgh Plug from Bridgeport Wire. Part is cut off, upset to form a tapered blank and roll threaded.

Easy on the dies... Bridgeport cold heading wire

The pipe plugs illustrated are just one of many different cold headed and cold rolled products made by Pittsburgh Plug & Products Co., Pittsburgh, Pa. When you're producing products such as these in such variety and in large volume, you have to be mighty careful on materials specifications. You need an alloy that not only readily cold forms but which will hold prescribed tolerances at high production rates. Otherwise, scrap losses and rejects mount up.

The answer in this case was Bridgeport Yellow Brass Wire, Alloy #16, the most popular and versatile of Bridgeport cold heading wires. Used in a scrapless nut former which makes possible a materials savings in excess of 40%, Alloy #16 meets all the requirements of the job which calls for wire to a prescribed OD with rigid tolerance specifications.

Yellow Brass Wire is just one of the many Bridgeport alloys for cold heading. It will pay you to check with your local Bridgeport Sales Office for help in selecting the alloy best suited to your production and product method. Our Service is prompt, dependable, backed by Bridgeport's Technical Service.

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Simon D. Strauss

An Answer to Nonferrous Critics

Mr. Strauss is one of the leading exponents of goodwill in the nonferrous industry.

Those who blame nonferrous price cycles on producers are off base, he says.

The real problem lies in the nature of the market. And it's a tough one to solve.

Simon D. Strauss: If fear of shortages were eliminated, it might help.

▪ The pen is mightier than the pick-axe. Or at least, as far as Simon D. Strauss, is concerned. By way of the trade publications field, he has become vice president of American Smelting & Refining Co. and an authority on the economics of nonferrous mining, refining, and marketing.

Mr. Strauss' clearheaded approach to the cyclical problems of nonferrous mining has made him a popular exponent of the industry.

Defends His Camp—"I think many people who are critical of the copper, lead, and zinc industries overlook the fact that they are basically mining industries — not metallurgical operations such as steel and aluminum," he says.

In a mining industry you can't control the production flow as easily as in a manufacturing plant, he points out. For the most part, you either run at capacity or not at all. So copper, lead, and zinc are fairly inflexible when it comes to supply and demand.

Offers Solution—"If the fear of lasting shortages could be eliminated, it would be of great help in eliminating severe price cycles," Mr. Strauss claims. "Actually, known reserves of these metals are ample. Users need not fear any period of extended scarcity." A possible solution: "An effective commodity exchange might help," he suggests, "if there were a sophisticated trading public to cushion the swings."

One could almost say that Simon Strauss was born with a silver spade in his mouth. His birthplace: Lima, Peru. The date: July 24, 1911. The son of an American mining engineer, he grew up in an atmosphere where metals were the topic of daily conversation.

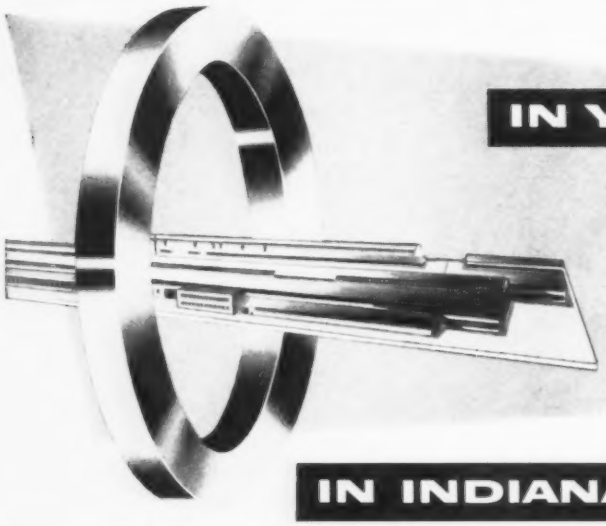
Forsakes College — At 16, he quit college to take a writing job on the Engineering and Mining Journal. He stayed five years, worked two more years as editor of a New Jersey weekly newspaper. Then he spent five years making analytical studies of large corporations for a statistical service. He covered the metal and coal industries and the building trade.

While he learned the fundamentals of mining by writing about them, the real proof of his ability came in 1941 when he was appointed an official in the Reserve Metals Co., a branch of the recently dissolved Reconstruction Finance Corp. His main function was to negotiate contracts with foreign governments for supplying strategic metals to the U. S.

TRY CMP's 3 IN 1 SERVICE

FOR RESTRICTED SPECIFICATION COLD ROLLED STRIP STEEL

Now there are 3 CMP plants equipped with today's most effective rolling and processing facilities for the production of "restricted specification" cold rolled strip steel. Strategic plant locations provide CMP customers with the security of 3 sources of supply, plus the opportunity for close working relationships which these local production centers make possible.

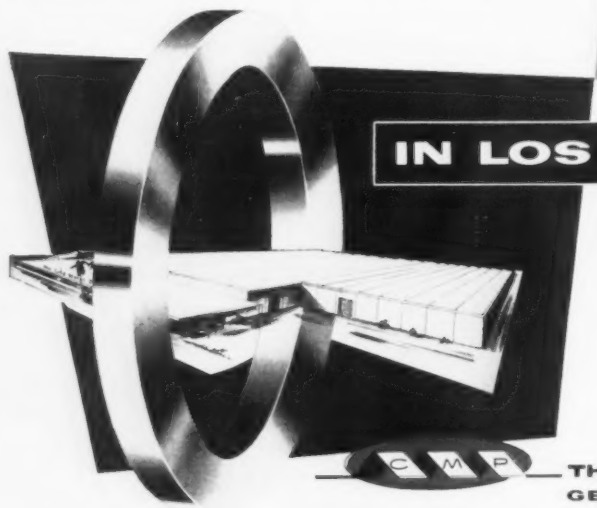


IN YOUNGSTOWN

General office headquarters and production facilities where CMP pioneered the processing of "restricted specification" cold rolled strip steel. Laboratory and research facilities are also here, staffed for continuing development and improvement of CMP products.

IN INDIANAPOLIS

Geographically situated to conveniently serve the fast growing midwestern market for specialized cold rolled strip, this recently built, all-new plant utilizes identical processing equipment as other CMP plants for producing a wide range of "restricted specification" cold rolled strip.



IN LOS ANGELES

Latest addition to CMP's producing facilities is this Los Angeles unit, the only plant in the West with CMP-type equipment. Faster service for West Coast steel fabricators, plus the know-how of steel mill-trained personnel provide a service opportunity not heretofore locally available.

THE COLD METAL PRODUCTS CO.
GENERAL OFFICES: YOUNGSTOWN 1, OHIO
PLANTS: YOUNGSTOWN, OHIO AND INDIANAPOLIS, IND.
SALES OFFICES: NEW YORK - CLEVELAND - DETROIT INDIANAPOLIS CHICAGO LOS ANGELES SAN FRANCISCO

Try CMP for 3 in 1 Service

Low Carbon, High Carbon — Annealed or Tempered, Stainless, Alloy, Electro Zinc Coated

Need for Cash Hard on Dividends

Something has to give in corporations' search for cash for future programs.

Mr. Humphrey's dropped comment that dividends are suffering is backed up by FRB figures.

▪ Deep in the voluminous testimony of outgoing Treasury Secretary George Humphrey before the Senate Finance Committee is a little-noted statement that you might put in your mental file.

"I think all well-run industry has paid out less dividends than they've earned in order to build up reserves for the future," he commented under questioning.

Hunt for Cash — While this might make a few dividend-hungry stockholders unhappy, there isn't much doubt of the validity of the statement. With the rate of capital expenditures at a record and still on the upgrade, business leaders are hard-pressed to find the money for needed growth and modernization of their production.

Tight money has aggravated this situation. Credit is hard to come by and expensive. Instead of borrowing, more of the capital expenditure money will have to come from earnings.

Three-Way Squeeze—This places new pressure on industry's price structure, as well as on dividends. The business executive now has a three-way battle on his hands. He must set aside more money for future needs; he must keep his stockholders happy with an adequate return, and at the same time grapple with pressures on prices. (Note Editorial, p. 7: Steel Price Hassle—Everybody Is in the Act.) And he just can't appease all three.

. . . First Quarter Profits Up, Dividends Down

Dividends Suffer — Going back to dividends, if your firm is cutting down slightly on its dividends, it has a lot of company, as mentioned in Mr. Humphrey's statement.

This is indicated in a Federal Reserve Board tabulation of 1957 first quarter sales, profits, and dividends of large corporations. In a surprisingly large number of cases, dividends declared are down from 1956 when related to profits.

Trend Indicated—In 200 large manufacturing companies, dividends declared in the first quarter of 1957 totaled $750 million compared with $841 million in the fourth quarter of 1956. But profits were up in the same period; $1,394,000,000 after taxes in first quarter, 1957, compared with $1,321,000,000 in fourth quarter, 1956.

This isn't exactly startling, but it reflects a significant change in policy for so short a period.

Take durable goods industries as another example: First quarter 1957 profits after taxes in 106 companies, $859 million; dividends, $437 million. In the fourth quarter, 1956, profits after taxes were $794 million while dividends were $482 million.

Profit Picture Good—The tabulation shows something more important than dividends, however. Although somewhat of a gloomy atmosphere has been spread about 1957, particularly in the durable goods industries, the figures don't bear it out, as indicated above.

As a group, however, the primary metals industries have not fared as well. Profits after taxes are down in the same quarterly interval from $378 million for the 39 companies to $344 million.

Surprisingly, automobiles and equipment profits jumped from the last quarter of 1956 to the first quarter, 1957. Profits after taxes for the 15-company cross section climbed from $218 million to $344 million.

Bad News for Tax Cuts

What's a Billion—There was a time not so long ago that a $1 billion surplus for the Federal government's fiscal year was something to cheer about.

But for those who hoped for tax cuts this year, the billion dollar figure is discouraging. It is less than half what had been freely predicted. It's also well under the $2.5 billion figure generally believed to be the surplus necessary for a significant tax cut.

In spite of all the Congressional talk on economy, there is little opportunity for much relief in the next year, either. Defense cutbacks, for example, don't represent so much of a cut in spending, but adjustment to climbing costs.

This will take some doing, incidentally, since the annual rate of Defense Dept. spending in the closing months of the just-ended fiscal year was well over $40 billion.

AUTOMOTIVE

Small Company Tackles Big Job

Goal Is Key to Cheap Auto Gas Turbine

Misco Precision Casting aims to cut cost of turbine wheel assemblies to $20-25 range.

Big Three agree that wheel is key to low-cost output of auto gas turbine.—By H. R. Neal.

▪ Hip deep in the race for a low-cost automotive gas turbine engine is a small but knowledgeable company in Whitehall, Mich.

Misco Precision Casting Co., has taken on the formidable assignment of developing an economical method of mass-producing turbine wheel assemblies for such an engine. The work is being done under a contract with Ford Motor Co. Ford is said to want gas turbine-powered vehicles on the road within five years.

Big Job—Here's Misco's assignment: Bring the cost of turbine wheel assemblies down to the $20-25 range. Some turbine blades alone now cost as much as $12 each to cast.

General Motors and Chrysler agree with Ford that the turbine wheel is one of the keys to low-cost production of gas turbine engines.

The Goal—Indications are that Misco may be concentrating on developing a method of casting hub and blades of the wheel assembly as a single unit. Experimental turbine engines built to date use a turbine wheel constructed of single-cast blades mechanically fastened to the hub.

Says a GM engineer: "The thought of a single cast turbine wheel is unavoidably attractive."

Apart from the technical problems involved in developing a single-unit assembly, flaw-free castings are a must. Otherwise the entire piece must be discarded.

SEEKS DEFECTS: New million volt x-ray unit at the Whitehall, Mich., plant of Misco Precision Casting Co., is part of a program to develop cheaper method of casting turbine wheel assemblies. The piece picks up defects in larger pieces, such as experimental one piece hub-blades.

The Company—Ted Operhall is president of the still-growing investment casting firm, which recently started up a new plant in Muskegon, Mich. The plant also houses research and development facilities. Other company units are situated at Whitehall and Detroit.

Misco has already established a reputation in the aircraft turbine blade field. It also produces aircraft accessories and components, and gets into such diverse fields as guided missiles, and locomotives.

New Casting Methods — Misco has developed several new processes which should aid its research on the "heart" of automotive gas turbine engines. In Mono-Shell, a ceramic shell is built up around a wax pattern by a series of dipping operations into a refractory slurry. This eliminates the massive invest-

Reduces Machining Time

with

BULLARD

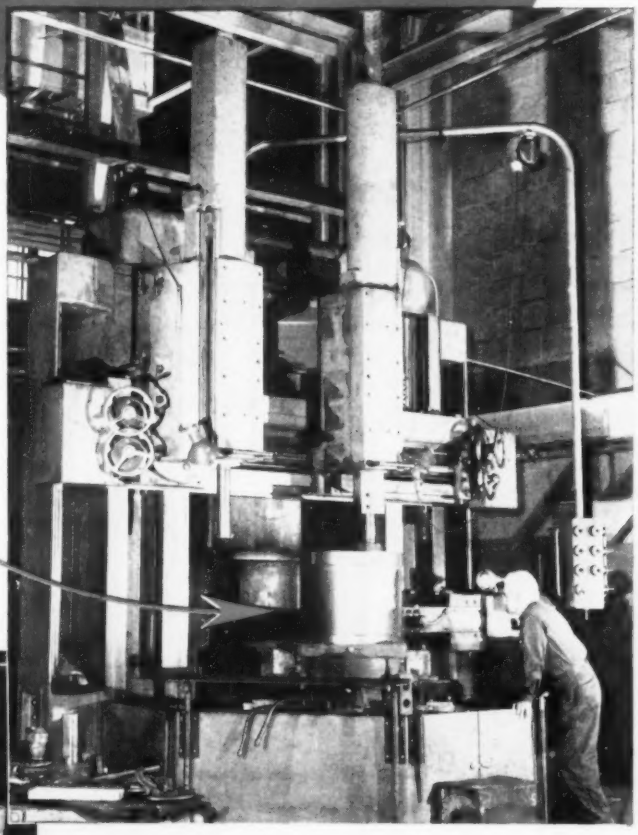
35% OVER EARLIER MODEL

Cut Master

VERTICAL TURRET LATHE

MODEL 75

In the machining of a barrel housing used in a large mechanical press, manufactured by the Clearing Machine Co., Chicago, Ill., Mr. L. W. Prochnow, Factory Manager says "our 66" Cut Master, Model 75 is a big, husky machine. Its heavier rams, overall rugged construction and greater horsepower provide higher speeds and feeds easily controlled from the movable Pendant. These features enable us to cut our floor to floor time, per piece, by four hours. And we've had no maintenance problems in nearly two years of operation." These same cost savings can be applied to your machining problems when considering replacement or additional capacity in your plant.



From rough casting, weighing 1,780 lbs., 28" in diameter and 36" long, to finished piece with a 35% saving in machining time.

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when cutting metals—
buy BULLARD

Our nearest Sales Office or Distributor will be glad to show you how or write for complete catalog to

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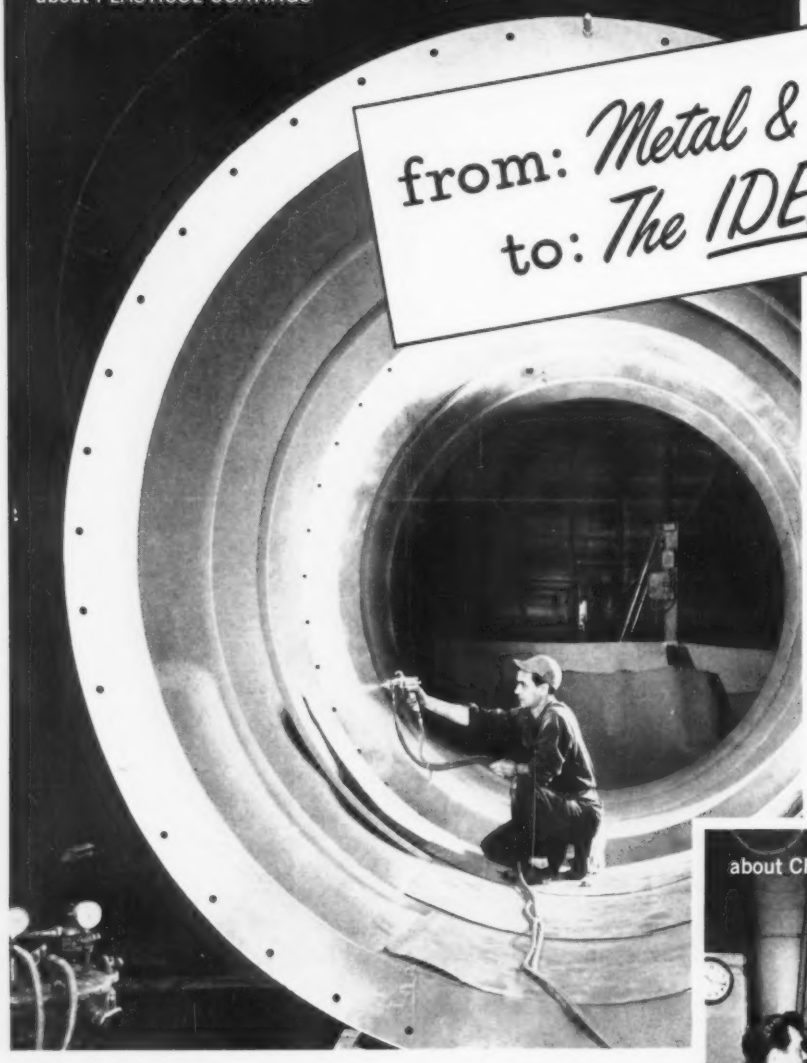
BRIDGEPORT 9, CONNECTICUT

about PLASTISOL COATINGS



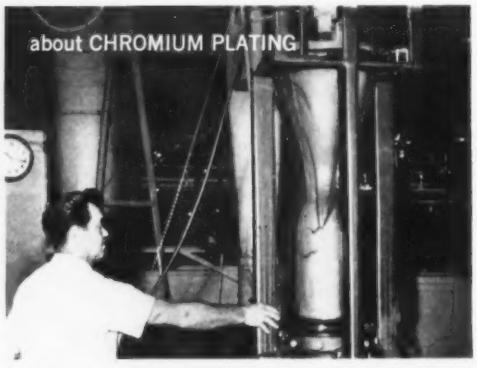
from: Metal & Thermit to: The IDEA Minded

How to make ordinary metals last longer

These large metal rings, being sprayed with a sheet-like coating of Unichrome Plastisol, will have extraordinary protection not only against corrosion but also *abrasion*. Past reports show that life of equipment subject to abrasion has been increased as much as twelve times with plastisol protection.

Unichrome Plastisols produce heavy-duty, thick, impact-absorbing, chemical resistant coatings. They make ordinary metals fit for severe service conditions. Suggested applications: As a "cushioning" coating for conveyors; also tank linings which cost less and prove better than sheet materials.

about CHROMIUM PLATING



High speed plating for high speed engines

One producer plates combustion chambers of rocket engines with chromium to gain its high melting point and corrosion resistance. The Unichrome SRHS® Chromium Plating Bath which was installed reduced plating time by 6 hours per engine. Furthermore, the leveling action of the bath smooths out the small imperfections in the surface being plated, producing a finer finish. Note: The SRHS Bath is also self regulating, giving more *foolproof* operation.

about WELDING

Well welded . . . world's largest coal trailer

Built by Marion Metal Products Co. to carry 95 cubic yards of coal, the largest bottom-dump hopper trailer weighs more than 119 tons. This specially engineered trailer was welded with Metal & Thermit "Murex" electrodes. These electrodes again demonstrated that they develop welds with good impact qualities, handle easily, deposit fast at high currents for economy in fabrication.

PLATING MATERIALS
ORGANIC COATINGS
TIN & TIN CHEMICALS
CERAMIC MATERIALS
WELDING SUPPLIES
METALS & ALLOYS
HEAVY MELTING SCRAP

METAL & THERMIT
CORPORATION
GENERAL OFFICES: RAHWAY, NEW JERSEY
Pittsburgh • Atlanta • Detroit • East Chicago • Los Angeles
In Canada: Metal & Thermit—United Chromium of Canada, Limited, Rexdale, Ont.

ment mold and reduces material requirements.

Improved quality results from better refractory properties of the material used, permitting higher metal pouring temperatures. Further economies result from reduced cycle times required for removing the wax and preheating the molds.

Tackling Intricate Cores—Accra-Core is another Misco development. This process permits the casting of larger units with intricate cores than is possible with conventional investment casting techniques. Surface quality is between that obtained from conventional sand casting and investment processes. This method consists of making a cope, drag, and core section of the mold from ceramic investment material.

A quick setting high temperature ceramic cement is used to bond the refractory materials as they are cast against the metal pattern. Mold sections are oven dried and then assembled as a complete mold. After preheating, up to 150 lb of metal can be poured into these molds. Stainless steel alloys and low alloy steel can be effectively cast with this process.

Vacuum Exploited — Vacuum metallurgy also plays an important part in the firm's research and development programs. High temperature alloys for gas turbine requirements contain materials such as aluminum and titanium in combination with nickel and cobalt base compositions. These require protection during the melting operation to prevent oxidation. Vacuum melting is the answer.

Alloy and hot molds can be charged as required through a system of vacuum interlocks so that a constant vacuum condition is maintained in the melting chamber. This permits rapid cycling of the operation and also prevents oxidation or thermal shock damage to the melting crucible.

A Growth Company — Misco, which has grown from 26 employees in 1948 to 1380 today, and is among the three largest producers of investment castings, is working hard toward becoming a prime supplier of auto turbines.

Detroit Briefs

Overhaul — This month Ford Motor Co. will undertake the biggest single machining job it has ever attempted. Grinding and polishing tables in the Rouge glass plant, in Dearborn, Mich., are to be resurfaced. In order to maintain uniform thickness in the glass, the 212 cast iron tables which carry glass under the grinding and polishing machines must be kept level and free of waves.

A milling machine, especially built for the job, by Morton Milling Machine Co., Muskegon, will shave a fraction of an inch of metal from each table. Tolerances can be held within 0.005 in., producing a surface near-perfect in smoothness. It is estimated that more than 17 tons of shavings will be removed from some 20,000 sq ft of table surface area.

Summer Tips—Now that the vacation season is about to move into high gear, Philip B. Hopkins, director of service development and training for Chrysler Corp. has outlined some important tips for summer travelers. Some are elementary, but they should be helpful.

Drain out winter antifreeze, flush the radiator, and refill with clean water and a rust inhibitor. Check tires for cuts and scoring. Keep tires inflated at the level recommended by your car manufacturer. Rotate tires at regular intervals of 3000 to 5000 miles. Check the spare tire regularly. Proper wheel alignment prevents excessive tire wear and adds greatly to steering ease. Look for such brake trouble indicators as a spongy pedal, low pedal, and squeaks or chatters when stopping. They are warning signs of potential trouble.

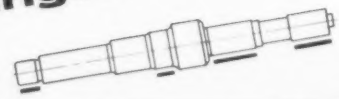
Thorough lubrication is a must. Wheel bearings and universal joints should be lubricated every 10,000 miles to prevent wear. Check fluid levels in automatic transmissions, power steering, and brake systems.

THE BULL OF THE WOODS — By J. R. Williams

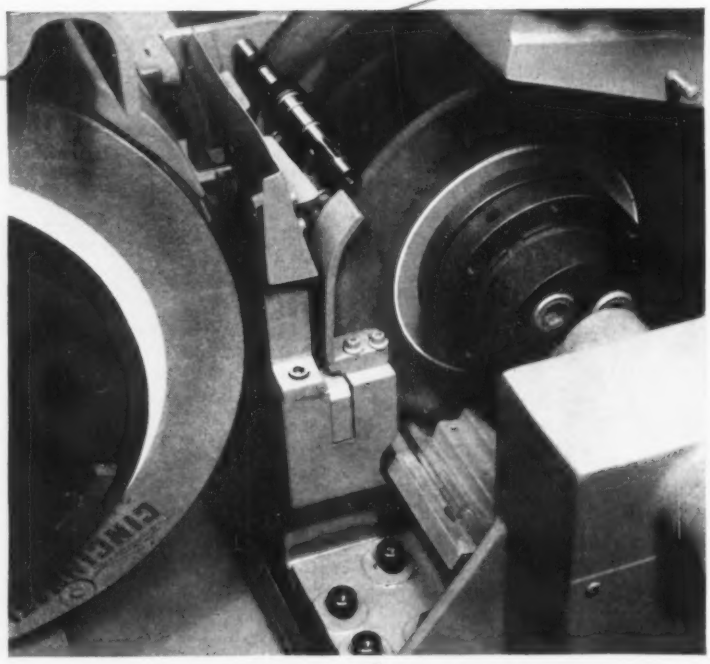
THERE'S A SPECIAL LUNCH IN THERE WITH A SLAB OF MY BIRTHDAY CAKE! SO ANYONE DOES ANY LUNCH BOX SWITCHING TODAY, I'LL CLOBBER 'EM BUT GOOD!
HAPPY BIRTHDAY!
POOR FRED-- HE SURE CAN'T HAVE HIS CAKE AND EAT IT, TOO, WITH THIS GANG AROUND!
ANY OTHER DAY IT WOULDN'T MAKE A BIT OF DIFFERENCE! WE COULD ALL SWAP AND WIND UP WITH A BALONEY SANDWICH, A PICKLE, A HARD-BOILED EGG AND A STORE-BOUGHT COOKIE!
FAIR WARNING
J.R. WILLIAMS

Cincinnati Filmatic Nos. 0·2·3·4·5·6 Centerless

The No. 2 is the machine for this job . . . grinding four diameters of household refrigerator crankshafts



FILMATIC



Multiple diameter jobs are "naturals" for CINCINNATI® FILMATIC Centerless Grinders . . . and for Cincinnati's 32 years' experience in centerless tooling. The illustration at the right shows how these two major elements of production—the right machine and the proper tooling—have been combined to reduce the cost of grinding four diameters on crankshafts for a well-known refrigerator. ¶ A new CINCINNATI FILMATIC No. 2 was selected for the job. All four diameters are centerless ground simultaneously; to close limits of accuracy; exactly in line with each other.

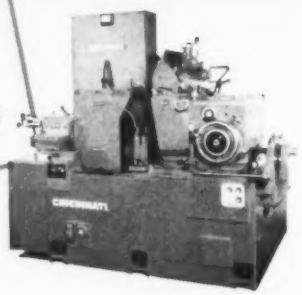
The operator merely pushes a button, and the entire grinding cycle proceeds automatically.

Much of the outstanding success of centerless grinding this part can be attributed to the machine. FILMATIC grinding wheel spindle bearings cannot deflect under wide infeed cuts; bed-rock design for grinding wheel spindle housing withstands maximum hp metal removal; swivel mounting of regulating wheel pile simplifies setups; anti-friction infeed slide reduces maintenance and helps to maintain close tolerances. Would you like to know more about the latest CINCINNATI FILMATIC No. 2 Centerless? Or perhaps the entire line? Look in Sweet's Machine Tool File.

CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO

CINCINNATI

CINCINNATI FILMATIC No. 2 CENTERLESS GRINDING MACHINE
CATALOG No. G-644-2



CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES • ROLL GRINDING MACHINES • SURFACE • GRINDING MACHINES • CHUCKING GRINDERS
MICRO-CENTRIC GRINDING MACHINES • CENTERLESS LAPPING MACHINES

States Cool to Ike's Proposal

Why States Won't Accept All Their "Rights"

At the rate of $1 billion a year, states aren't eager to take over functions now performed by the Federal government.

That's why you don't see governors hurrying home to advocate action.—By G. H. Baker.

▪ President Eisenhower has issued a challenge to the states: Take over those functions that are rightfully yours, and thus head off further Federal expansion into your areas.

Now that he has given this call for action, Ike is appraising the state governors' response to it. To date, the response has been unseasonably chilly. A set of figures newly disclosed by Congress shows a prime reason for this coolness.

Billions Go To States — Since 1934, U. S. Treasury funds amounting to $31 billion have been granted to the states. That's more than $1 billion per year. And it's taxpayers' money that has made a round trip through Washington before being returned for use within the states.

To the President, this shuttle of tax revenues makes little sense. He sees more logic in a system whereby the states would assume responsibility for programs virtually at their doorsteps, such as urban renewal and disaster relief.

States Abdicate — Where the states decline to take on these programs, he warns, the federal government too often steps in. Ironically, this national structure—the creature, not the parent, of the states—contracts to handle functions the states avoid. In the process, it gets bigger, costlier, harder to dislodge from its new gains.

The alternatives, as seen by Ike, are well defined. The states can continue to shun programs they can handle, and leave more gaps for the federal government to fill. Or they can revise their fiscal plans, tackle the jobs in their spheres, and regain their traditional powers.

He urges them to choose the latter course.

Metalworking Group Gets Funds

Despite the wave of budget-cutting that has swept Washington, no money cuts are being ordered for the Metalworking Equipment Div., Business and Defense Services Administration (U. S. Department of Commerce).

The many "from the heart" protests from machinery manufacturers to the Congress and to the Secretary of Commerce regarding proposed cutbacks in the services furnished by the MED convinced the policymakers at the top level that the Division was providing the kind of service that the machinery industry needs.

Do Newsbreaks Threaten Security?

An Old Story—Dark charges of security breaks by news reporters are looking pale in the light of congressional inquiry.

It's becoming an unpleasant routine for special federal groups to accuse newsmen of disclosing defense secrets. This happened, reminds Rep. Moss, D., Calif., way back when the Coolidge Committee on classified information made its report to the Defense Dept. The committee recommended grand jury action to force a reporter to reveal his source when a military secret is revealed.

Now it's the Congress-appointed Commission on Government Security that proposes jail terms for newsmen who publish federal data on items tagged "secret." Rep. Moss, chairman of a House Government Information subcommittee, is openly skeptical of the purported need for such action in the name of national safety.

Get the Facts—His refusal to accept unsubstantiated charges that news media are careless of American security has brought a reply from the Commission. This is a list of more than a dozen instances in which unnamed local and national publications allegedly endangered the U. S. by breaking stories.

Rather than rely on this document, Rep. Moss and his colleagues are gathering testimony from military witnesses. The lawgivers have asked the Army how it is possible to tell if a story came from a secret source.

The Army admits it cannot tell that such material was not developed from intelligent deduction, rather than from a security leak. This answer is no surprise to the Moss group. The subcommittee indicates it will take some convincing before it believes the national interest is imperiled by the press.

New Life for Coast Shipyards

Spread-the-Work Policy Lends a Hand

Tanker construction is also spreading to near - dormant West Coast yards.

But comeback isn't easy. Costs are still high and reactivation of yards is expensive—By R. R. Kay.

▪ West Coast shipbuilding may yet get back on its feet. Flattened by years of postwar inactivity, the industry begins to show signs of a comeback. At best it will be a tough fight.

The Navy's spread-the-work-around policy is helping. Important conversion jobs and orders for new ships are perking things up. Busy eastern and foreign shipyards, loaded with tanker construction, make West Coast yards attractive again.

Some New Orders—One major builder, Bethlehem Pacific Coast Steel Corp., has orders for four 32,500-ton tankers they'll build in the San Francisco Bay area. Bethlehem's yards there are now in the finishing up stages on the 2.5-million gal. capacity Angelo Petri wine tanker.

And in Los Angeles, Todd Shipyards Corp. just launched an expensive program to make its facilities ship-shape for new construction. The yard has not handled a major vessel-building job since World War II—only repair work. Its reactivated way will take ships up to 600 feet long. And Todd plans to really go after the new construction business.

To keep things humming, the firm's Los Angeles yard has a nice new tanker-stretching job.

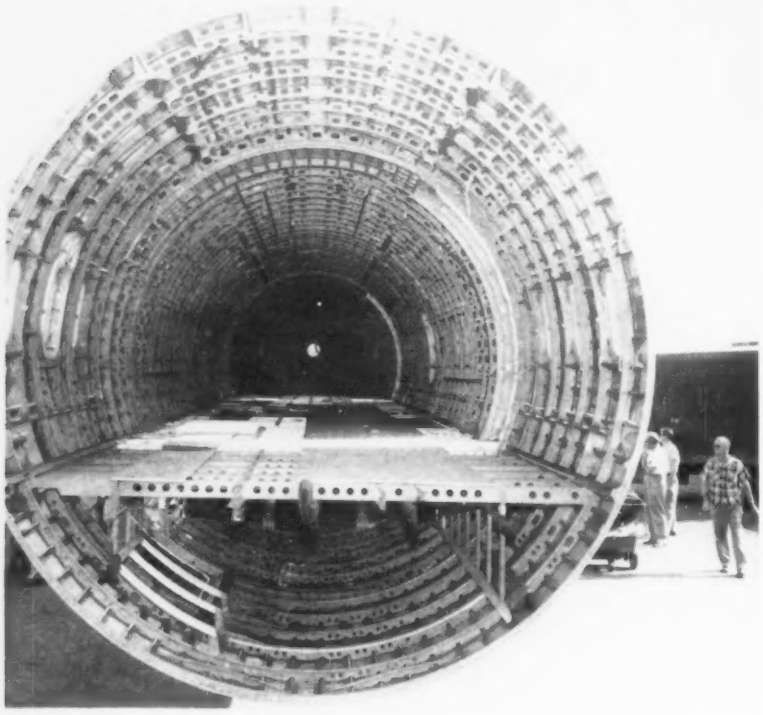
Nuclear Job Sought — Puget Sound (Wash.) is making the strongest kind of pitch to build an atomic-powered merchant ship. The area's Congressmen are pushing for it.

Meanwhile, the Navy is busy in the Pacific Northwest. The Puget Sound Naval Shipyard at Bremerton is clearing its decks for a $50 million reconversion on the aircraft carrier Coral Sea. This job will take 1.3 million man-days.

Policies Help NW—Seattle area shipbuilders will now find it feasible to bid on craft scheduled for delivery in San Diego. That's because of the Navy's new policy on delivery points for utility landing craft. It's now OK for a builder to deliver his vessels under their own power without the previously-imposed 1000-mile limit. Seattle shipbuilders are eager for a chance to bid on such jobs.

The comeback trail for West Coast shipbuilding won't be easy. Experts warn that Coast shipbuilding costs are too high — must be pared down. What makes it rough for the builders is the need to reactivate dormant yards and rebuild labor forces. The big bulk of World-War-II-trained workers have long since gone to other industries.

TAKING SHAPE: Fuselage section of the first Lockheed Electra prop-jet airliner moves into final assembly area at the firm's Burbank plant. Plane is built to carry 91 passengers, and is scheduled for January flight.



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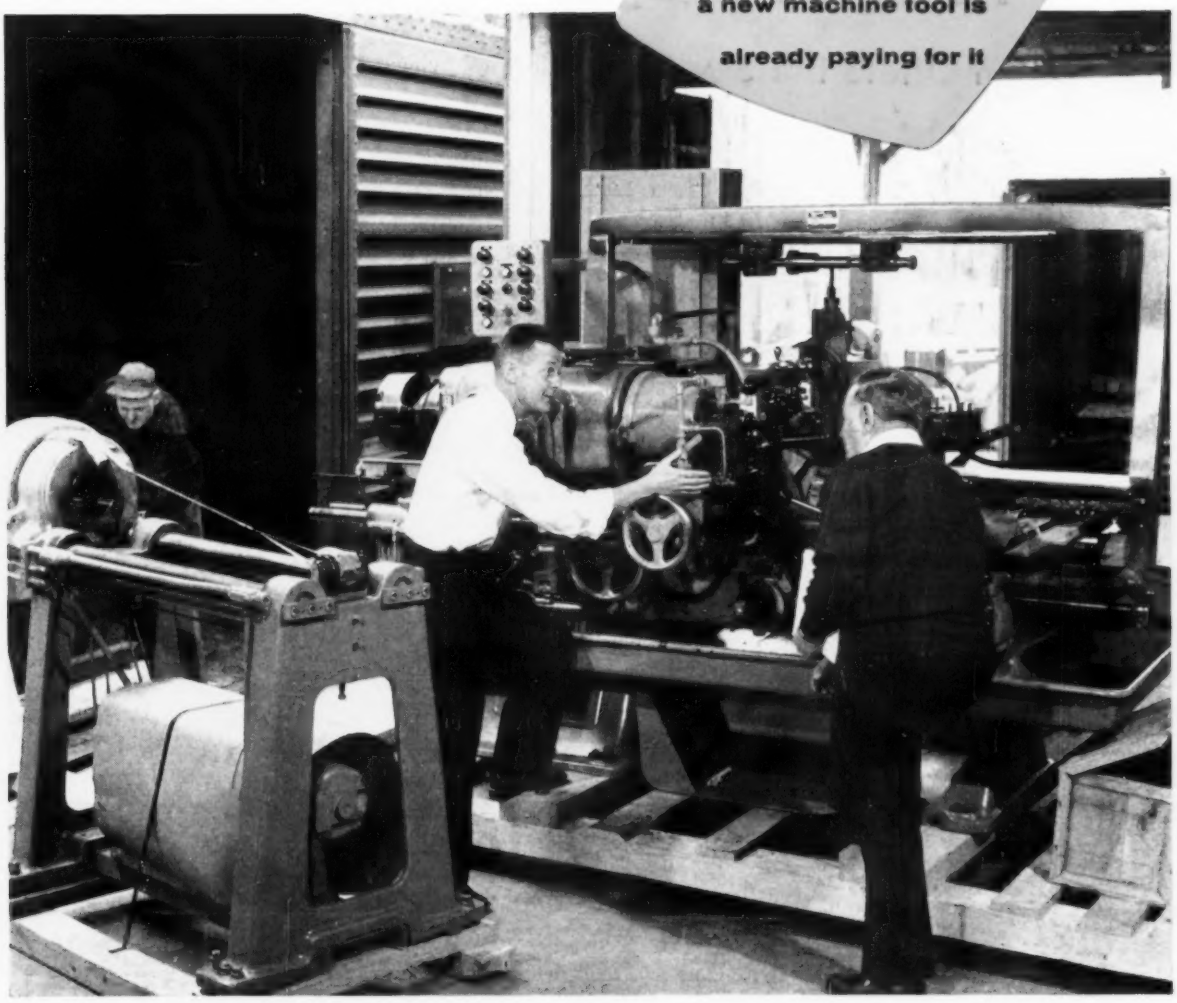
the man who needs
a new machine tool is
already paying for it



Blessed Event, Plant-Style

They're passing out cigars in the front office. And here on the delivery platform, the production V.P. is on hand personally to welcome the new arrival . . . a J & L Turret Lathe.

Beaming grins like his can be seen throughout the plant, and with good reason: everyone figures to benefit from this new equipment. The operator's job is made easier, and his opportunities for increased compensation are better. Production management can start right away on those new production estimates, and begin planning further improvements. Top management knows that the competitive position of the company is stronger. And right down the line, that profit-sharing plan looks sweeter than ever.

Is *your* company benefiting from the increased production and added versatility offered by advanced J & L equipment?

If not, *why* not? We offer a variety of liberal finance plans, and we'd like to give you all the details. Write today.

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools • Thread & Form Grinders

How to Encourage Machine Tools

French Plan Offers the Sky to Builders

Industry of France needs the tools if it is to expand according to plan. It would like to use French-made tools if possible.

But any U. S. builder would be amazed at pie-in-the-sky proposals.—By E. J. Egan, Jr.

▪ French proposals for expanding that nation's machine tool production capacity and modernizing equipment in user's plants must sound like Alice - in - Wonderland stuff to U. S. builders and their customers.

Here are some of the things recommended to the French National Assembly by a Committee for the Modernization of the Processing Industries:

1. Continuing the present policy of not taxing new investments in machine tool industries. (Currently, 19.5 pct accrued taxes on added value do not apply to investments). In the Committee's view, any reimposition of taxes would simply boost tool prices and cause an estimated sales drop of more than 16 pct.

How to Beat Inflation—2. Assisting French machine tool users to amortize their equipment, either by (a) allowing accelerated amortization, (b) authorizing amortization at over 100 pct, (c) exempting taxes on income retained for equipment renewal. (Ed. Note: The (b) proposal is a real inflation beater. It allows replacement reserves to accrue in amounts greater than the costs of amortized items.)

3. Granting builders medium-term (10 years) equipment credits at a 4 pct interest rate. The idea behind this is to aid builders in meeting an expected rise in demand, and to meet it with reasonably-priced tools.

More Encouragement—4. "Government encouragement" to builders in studying and building new machines technically superior to equipment now being imported by French users.

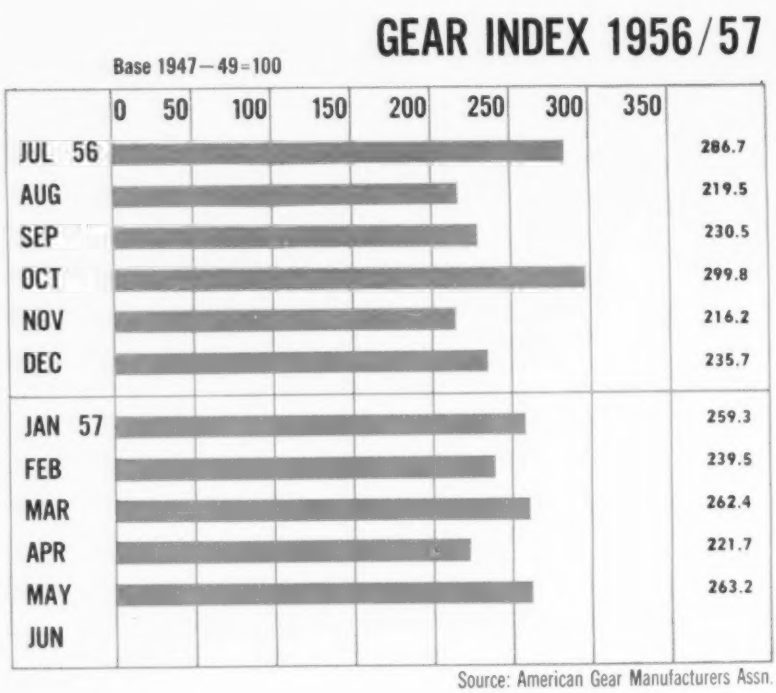
5. Granting additional "assistance" to French machine tool builder-exporters with the object of establishing and/or reinforcing established market positions in certain areas.

6. Explore the merits of a government investment fund to assist French industries in setting up plants in underdeveloped areas and equipping them with French machine tools.

7. Protecting the domestic machine tool market against imports as long as French costs remain higher than foreign costs.

There's no telling whether any or all of these proposals will actually wind up in legislation as part of the National Assembly's Third Modernization and Equipment Plan.

Tools Are Needed — But this much is certain: The French metalworking industries are expanding and producing more goods. To maintain or even increase this momentum, they need more new machine tools. At present, 45.4 pct of the metalworking equipment used in non-defense industries is more than 20 years old. Only 38.1 pct of the total tools in use are 10 years old, or less. France wants to reverse these ratios by 1961.



Source: American Gear Manufacturers Assn.

JONES & LAMSON
THREAD TOOLS

the man who needs
a new machine tool is
already paying for it

Each and Every J & L thread tool product guarantees quality... reduces perishable tool cost

J & L's well-known system of "No Approximations" applies right across the board, for all J & L Thread Tool Products.

Die Heads — Revolving and stationary types for multi-spindle automatics, drill presses, special machines or turret and engine lathes.

Tangent Chasers — Can be changed in seconds; give up to 30 foolproof resharpenings; interchangeable between revolving and stationary types. Class III threads are guaranteed . . . every time!

Collapsible Taps — Parts are interchangeable between sizes, including shanks. Chasers are interchangeable with J & L Solid Adjustable Taps.

Modern-Magic Chucks & Collets — One-piece shank and body construction.

Style "M" Stud Setters — Automatically grip and release studs at proper depths.

Write for brochures "Let's talk about Thread Tools," and "Which Costs More — Machine Tools or Perishables?", JONES & LAMSON MACHINE COMPANY, 511 Clinton St., Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools • Thread & Form Grinders

INDUSTRIAL BRIEFS

Farwest Switch—To expand technical service to the aircraft and guided missile industries, Metals & Controls Corp. will open a West Coast Design Engineering Facility in July. Its work will be to engineer supplementary actuating systems for Klixon miniature precision switches in aeronautical and electronic applications.

A Size Larger—J. H. France Refractories Co. has initiated a modernization and expansion program involving some $250,000. This program is expected to benefit shipping and delivery to area customers by providing larger production capacities at the company's Snow Shoe Plant.

A Lot of Breeching—A contract for 120 tons of breeching has been let by the Rust Engineering Co. to McAllenan Bros. Co., Pittsburgh. The installation will cost in excess of $80,000 and will be placed at the new Kaiser Aluminum plant at Ravenswood, W. Va.

Overseas Venture—The Gisholt Machine Co. has organized a subsidiary company to be known as Gisholt Machine Co. (Great Britain) Ltd. The new subsidiary will be located in London and will subcontract balancing and superfinishing machines to be expressly manufactured for overseas market.

New Letterhead — Consolidated Electrodynamics Corp., Pasadena, Calif., has changed the name of its Electronic Industries Div. to the Alectra Div. Products of the division include portable test instruments, printed wiring, transistor circuitry, and specialized electronic components.

Safe Stamping Ground — The National Safety Council's "Award of Honor" has been presented to Chrysler Corp.'s Nine Mile Press plant near Detroit. This facility logged over 1.9 million man-hours without a disabling accident during 1956.

Loud and Clear—General Electric Co.'s Communication Production Dept. has developed a new transistorized power supply. To provide greater reliability in two-way radio communication equipment, it is designed to effect savings in component replacement. It replaces the receiver portion of the mobile power supply, with life expectancy equal to that of an entire mobile combination.

Round 4 Coming Up—The Carborundum Co. has launched a $3.2 million modernization and expansion program. Involved are its three silicon carbide furnace plants in the U. S. and Canada. Participating in the project will be the Niagara Falls, Vancouver and Washington plants. The new expenditure represents the fourth silicon carbide expansion during the past nine years.

More Exurbanites — Square D Co. marked the completion of its $3.5 million manufacturing plant in Glendale, Wis., with an open house program for employee families. About 400 employees from the main Industrial Controller Div. plant in Milwaukee are expected to be transferred as the initial work force with an eventual requirement of 800 persons.

Wider Range — The Jervis B. Webb Co., Detroit, has purchased the Spanmaster Crane Co., with manufacturing facilities in Los Angeles. The company has also acquired 34,000 sq ft of manufacturing facilities in Detroit. The acquisition gives the company a more complete service for mechanized materials handling.

Alkali Metals Talk — Marshall Sittig, president and managing director, American Lithium Institute, Inc., has been appointed chairman of a symposium on alkali metals. The symposium will be held at the 133rd national meeting of the American Chemical Society in April, 1958, at San Francisco. Technical subjects include: lithium, sodium, potassium, rubidium, cesium, and francium.

Metal Removal—Spring Garden Institute, Philadelphia, has established the Metal Removal Center. The Institute is equipped to do basic research for industrial clients on metal removal techniques. It also proposes to conduct metal removal seminars devoted to basic machinery theories and the economics of metal removal practices.

Good Interest—More than $54 million has been distributed by Union Carbide Corp. under an employee savings plan. Under this plan, employees set aside up to 7½ pct of their earnings. The company adds 10, 20, or 30 pct of the saving depending on whether the employee has one, two, or three years of company service.

Sales Network—Pratt & Whitney Co., W. Hartford, Conn., will establish branch offices in 9 cities in the United States. In addition to the present 16, two major offices in Rochester, N. Y., and Hartford, Conn., will move to new expanded locations. Expansion is expected to be completed before year end.

Information Please—The Teller Co. has put out a brochure entitled "A Guide for Selecting an Engineering Firm." It answers questions asked by companies having engineering problems.

"Sorry, I must've dozed off . . ."

JONES & LAMSON
MACHINE TOOLS

the man who needs
a new machine tool is
already paying for it

Now – a machine that turns, bores and faces with great accuracy . . . at truly low cost

The new Jones & Lamson Precision Boring Machine may very well be just what *your* production operation needs. This new machine performs turning, boring and facing operations accurately, speedily and economically. Here it is shown on the job at Olson Mfg. Co., Worcester, Mass., turning, facing and boring electronic parts, in lots of 4000 to 6000 pieces. Two O.D.'s are held to .0005″, and two bores to .0002″. Concentricity between the bores, I.D.'s, and faces, is held to a total of .0008″, at high production rates.

The J & L Precision Boring Machine is ideal for both long and short runs . . . is extremely versatile . . . is easy to set up . . . and spindle runout is less than .000020″. Maximum swing is 10″ dia., and maximum bore is 3″ dia. Single or double spindle; push button cycling, manual or automatic.

Write for complete details. JONES & LAMSON MACHINE COMPANY, 511 Clinton Street, Springfield, Vermont.

Turret Lathes • Fay Automatic Lathes • Milling & Centering Machines • Optical Comparators • Thread Tools • Thread & Form Grinders

A. R. Atkinson, appointed marine development engineer, Product Development Dept., Kaiser Aluminum & Chemical Corp.

J. W. Lowry, named purchasing agent, Southern district, Republic Steel Corp., Gadsden, Ala.

F. J. Pribanic, promoted to division controller, Blaw-Knox Equipment Div., Blaw-Knox Co., Pittsburgh; **J. G. Wills,** named asst. works manager.

A. T. Zodda, appointed vice president, operations, Olin Mathieson International Corp.

W. H. Tock, appointed asst. to chief engineer, Basic Inc., Cleveland.

J. R. Lenox, elected vice president, operations, Datamatic Corp., Newton Highlands, Mass.

D. A. Blaisdell, elected executive vice president, The Baird Machine Co.

Albert Feucht, named manager, Cleveland plant, LeRoi Div., Westinghouse Air Brake Co.

W. J. Faust, elected vice president and treasurer, Bridgeport Brass Co.; **D. C. Bell,** elected controller.

J. L. Gordon, elected secretary and asst. treasurer, and **R. C. Kirkpatrick,** controller, Continental Gin Co., Birmingham, Ala.

W. E. Rufleth, named manager, telemetering systems applications, The Bristol Co., Waterbury, Conn.; **K. R. Neale,** appointed manager, Electronic Products applications.

W. A. Steele, becomes executive vice president, Wheeling Steel Corp.

W. F. Fuller, named general superintendent, production, Cyclone Fence Dept., American Steel & Wire Div., U. S. Steel Corp.

H. J. Balhouse, appointed manager, Nuclear Div., Alloy Steel Products Co., Linden, N. J.

S. A. Leone, named sales manager, Special Products Div., The Colson Corp.

T. F. Mummery, Jr., appointed manager, cutting tool sales, Besly-Welles Corp.

G. W. Wunder, appointed manager, Nuclear Metals Div., National Lead Co.

P. W. Koenemund, elected vice president, operations and engineering, Wheeling Steel Corp.

F. D. Fernsler, named manager, Nut Dept., Standard Pressed Steel Co., Jenkintown, Pa.

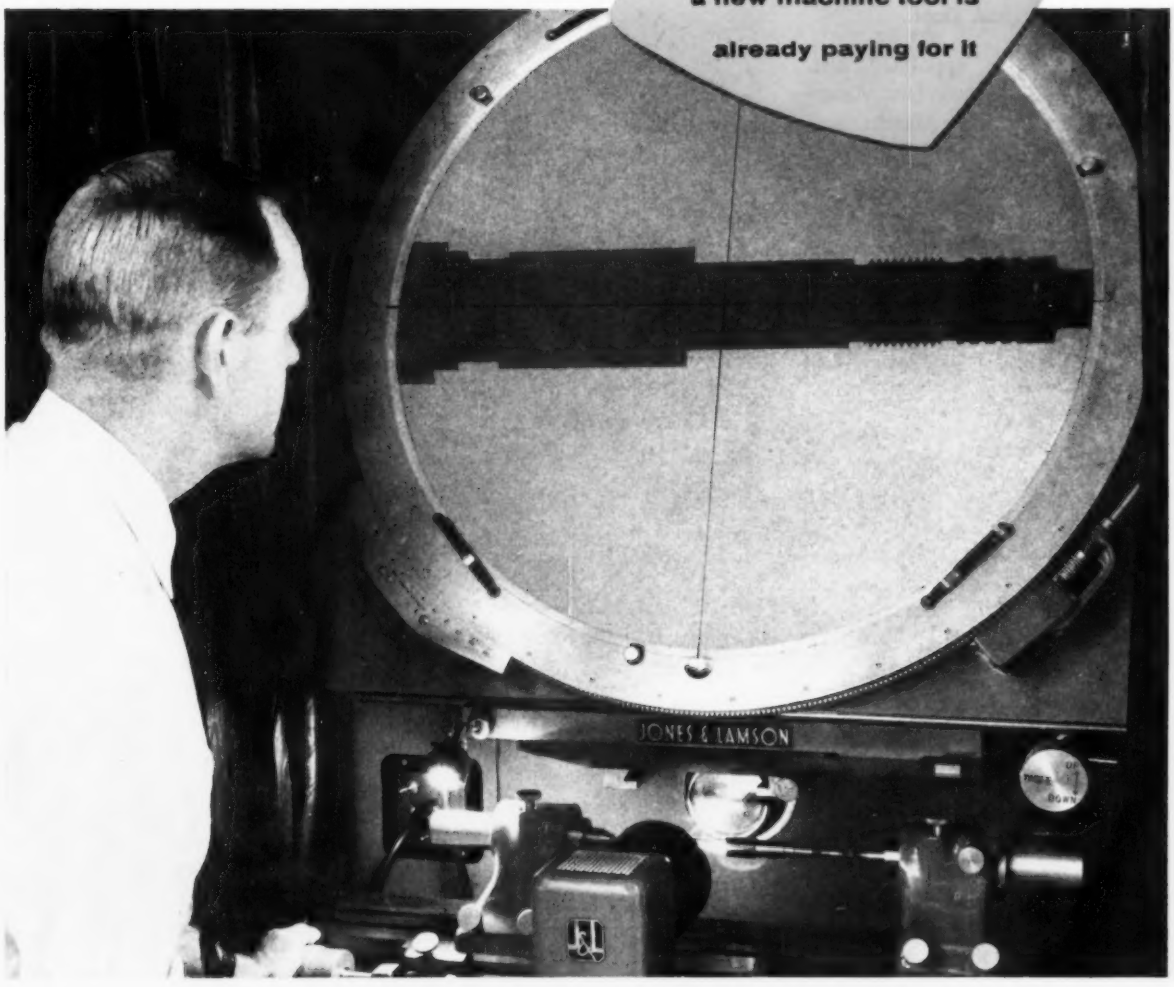
L. A. Wigley, appointed asst. district sales manager, Seattle, Wash., district sales office, Republic Steel Corp.

J. A. Richardson, appointed plant manager, Ford assembly plant, Lorain, O.

Following appointments are within the Indiana Harbor Works of Inland Steel Co.: **C. C. Mahlie,** pro-

JONES & LAMSON OPTICAL COMPARATORS

the man who needs a new machine tool is already paying for it



Inspections formerly "Impossible" are now done at a glance

Not so very long ago, the quality control inspection of intricate parts was a mean, painstaking job. It called for a number of gages, lots of computations, a good sense of "feel" and, in many cases, sheer instinct. Even then, there was a margin for error.

Things are quite different now. Take this application, for example. The piece being inspected is a precision gear shaft. Its oil grooves, shoulder lengths and several diameters, as well as the lead, pitch diameter and thread angle of its thread and worm are *all* inspected in *one simple operation* by a Jones & Lamson Optical Comparator. And the inspection is precise, to .0001".

The speed, accuracy and versatility of J & L Comparators could very well improve *your* production. Write for our latest Comparator Catalog. JONES & LAMSON MACHINE COMPANY, 511 Clinton St., Springfield, Vermont.

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moted to superintendent, Service Dept.; **K. R. Mattson,** promoted to asst. superintendent Openhearth & Blooming Mill Div., Metallurgical Dept.; **C. L. Pruitt,** promoted to asst. superintendent, Inspection Div., Metallurgical Dept.

E. V. Pierce, appointed asst. sales manager, Kenosha Div., American Brass Co.; **J. L. Marvin,** promoted to Chicago district sales manager.

Felix Zawaski, appointed plant manager, Gear-O-Mation Div., Michigan Tool Co., Detroit.

S. C. Stratton, appointed vice president, manufacturing, Fageol Products Co., Kent, O.

W. E. Wotring, appointed project manager, electronics planning group, The National Supply Co.

H. B. Casper, appointed purchasing agent, The Frank G. Hough Co., Libertyville, Ill.

George Morton, appointed general manager, operations, Pressed Metals of America, Inc.

E. D. Hoyt, appointed Cleveland regional manager, Lamson Corp.

J. F. Allen, promoted to manager, Guided Missile plant, Cameron Iron Works, Inc., Houston.

E. N. Hargrave, appointed sales manager, Hoist & Crane Div., Fabricated Steel Service Inc.

C. R. Malmister, appointed Western divisional sales manager, The Michael Flynn Mfg. Co.'s Extrusion Div.

H. T. Maltby, named comptroller Daubert Chemical Co., Chicago.

W. W. Leahy, named Chicago district sales manager, DeWalt Inc., Lancaster, Pa.

E. H. Lang, elected chairman of the board of directors, Erie Forge & Steel Corp., Erie, Pa.

E. M. Meyer, appointed Chicago district sales manager, Bliss & Laughlin, Inc.

J. E. Taylor, appointed abrasive engineer, Toledo, O., Norton Co.

T. E. Crawford, promoted to mid-continent sales manager, Container Div., Jones & Laughlin Steel Corp.

F. B. Winther, Jr., named manager, sheet and strip sales, Cincinnati steel service plant, Joseph T. Ryerson & Son, Inc.

F. G. Moser, promoted to manager, original equipment sales, Johnson Bronze Co., New Castle, Pa.

W. B. Revenaugh and **C. C. Benedict,** appointed asst. division comptrollers, Plymouth Div., Chrysler Corp., Detroit.

A. R. Gaus, elected president, Erie Forge & Steel Corp., Erie, Pa.

F. A. King, appointed sales manager, Safety Products Div., Mine Safety Appliances Co.; **H. N. Trice,** appointed marketing services manager, Safety Products Div.

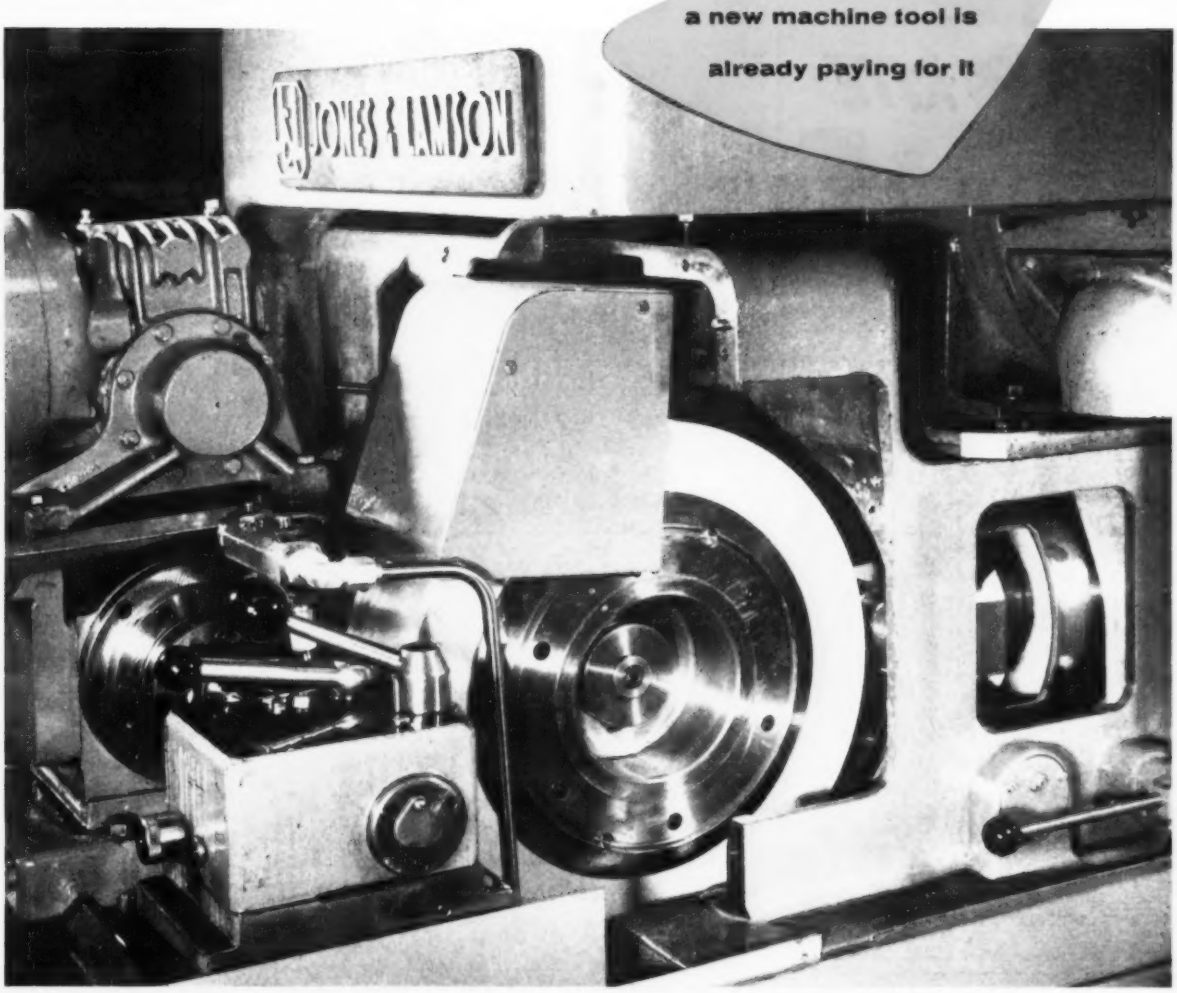
C. C. Lonsdale, named superintendent, Hallowell Div., Standard Pressed Steel Co., Jenkintown, Pa.

A. R. Evans, named asst. director, Real Estate and Insurance Dept., Westinghouse Electric Corp.

H. E. Skelley, promoted to power and fuel engineer, Indiana Harbor Works, Inland Steel Co.; **E. J.**

JONES & LAMSON
"AUTOMATION"

the man who needs
a new machine tool is
already paying for it



Now – for the first time in grinding history... no cycle time out for wheel dressing

Jones & Lamson is now introducing "PFC" (perpetual form control) grinding, an automated high production grinding method that has been termed "the greatest improvement in grinding in 50 years." It represents the first broad-scale industrial application of "CDP" (cemented diamond particles).

PFC, the result of several years of cooperative research and development by Jones & Lamson and Koebel Diamond Tool Co., Detroit, makes it possible to (1) *Completely* automate grinders. (2) Re-shape and re-size wheels faster than by any other method, and to do it continuously, with no time out for wheel dressing. (3) Control grinding wheel shape and size throughout a CDP cutter life of many months, without any attention to the cutter-dresser. (4) Provide and maintain a faster-cutting surface, free of debris. (5) Produce and maintain accurate grinding wheel shapes and forms within narrow dimensional limits.

Write for folder No. LO-5709. JONES & LAMSON MACHINE COMPANY, 511 Clinton Street, Springfield, Vermont.

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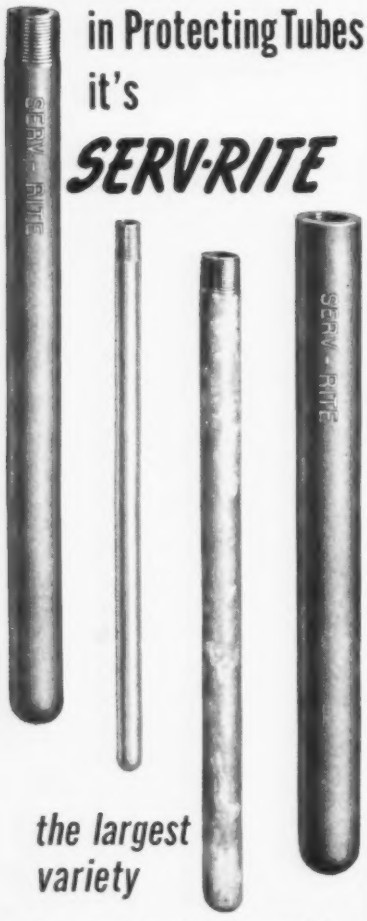
for any requirement in Protecting Tubes it's

SERV-RITE



the largest variety

In size and length, in iron, nickel, and alloys, and in formed or precision drilled, Gordon has about the largest variety of thermocouple protecting tubes. And you get off-the-shelf delivery on most any of this great variety of "standard" tubes. Gordon also makes protecting tubes to specifications for special requirements.

Give Serv-Rite a trial on your next protecting tube requirements. You can't go wrong. Careful manufacture and rigid inspections assure satisfaction. Get full information today. Ask for Bulletin 11-13.

● Bulletin 11-13 gives general application data, specifications, and ordering information on Serv-Rite protecting tubes and protecting wells — the largest grouping in one listing.

6221

CLAUD S. GORDON CO.

Manufacturers · Engineers · Distributors

617 West 30th St., Chicago 16, Ill.
2017 Hamilton Ave., Cleveland 14, O.

Valonis, promoted to shape products engineer.

T. L. Price, appointed manager, manufacturing, Buffalo, N. Y., plant, Chemical and food processing equipment, Buflovak Equipment Div., Blaw-Knox Co., Pittsburgh.

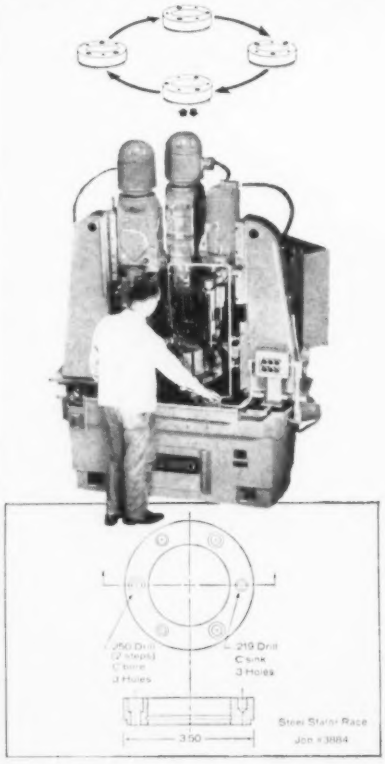
Mark Jehn, appointed general claim manager, Joseph T. Ryerson & Son, Inc.

A. B. Nichols, Jr., appointed sales manager, Tube Div. and **Gordon Barlow,** appointed asst sales manager, Tube Div., Sun Tube Corp.

R. F. Gaylord, appointed manager, Boston district office, Niagara Machine & Tool Works, Waltham, Mass.

A. L. Zerbey, Jr., appointed asst. manager, sales, New York Div., Island Creek Coal Sales Co. Huntington, W. Va; **B. W. Waring**

EVERY 12½ SECONDS



This Kingsbury indexing automatic performs these three operations on 290 steel stator races per hour (gross). Three vertical operating units have multi-spindle auxiliary heads. All tools have guide bushings to maintain accuracy. An air cylinder actuates the clamp.

Simple (like this) or complex, a Kingsbury is the best indexing automatic you can buy:

it will be fully tooled, ready to produce
it will meet your specifications for accuracy and production rate
it will pay for itself in a matter of months

We have designed, built and tooled thousands of automatic drilling and tapping machines. It is our only business. May we come see you? Kingsbury Machine Tool Corporation, Keene, New Hampshire.

KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

IN BUSINESS MACHINES, TOO,

Sharonsteel Quality STANDS OUT

• These machines are encased in Sharonart*—the popular rolled-in surface pattern steel. Sharonart* is one of many steels developed by Sharon engineers during the past half century to help the Business Machine Industry make products look better, work more efficiently and last longer.

To change the style—change the steel to Sharonart Literature and sample kits upon request. **Sharonart*** is a trademark of the Sharon Steel Corporation.

SHARONSTEEL

For 56 Years a Quality Name in Steel

244

SHARON STEEL CORPORATION, SHARON, PENNA.

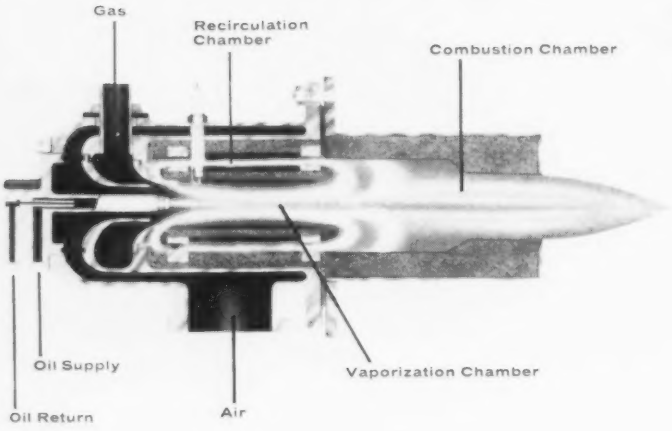
CHICAGO, CINCINNATI, CLEVELAND, DAYTON, DETROIT, GRAND RAPIDS, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, NEW YORK, PHILADELPHIA, ROCHESTER, SAN FRANCISCO, SHARON, SEATTLE, MONTREAL, TORONTO

THERMAL'S

COMBINATION

GAS-OIL BURNERS

the flame is the same . . .
with **OIL** *or* **GAS**



This versatile burner retains its high velocity combustion characteristics whether the fuel used is distillate oil or gas. The flame is short and non-luminous with an exit velocity of between 300 and 500 ft/sec. On either fuel, 85% of combustion takes place within the burner itself and the flame length seldom exceeds 1 ft. Switching fuels is simple and the burner need not be shut off during the changeover.

THERMAL combination burners provide high convection heat transfer for furnaces, dryers and air heaters and tempering air can be added without creating soot or smoke. Special applications include ladle heating, submerged combustion, skelp furnaces and packaged high capacity steam generators.

WRITE FOR BULLETIN #109

OTHER THERMAL PRODUCTS & SERVICES

Gas & Oil Burners • Heat Exchangers • Submerged Combustion • Air Heaters • Gas Generators • Combustion and Heat Transfer Engineering.

THERMAL

Thermal Research & Engineering Corp.

CONSHOHOCKEN • PENNSYLVANIA

REPRESENTATIVES IN PRINCIPAL CITIES

appointed asst. manager, sales, Greensboro Div.

Otis Green, appointed sales engineer, San Jose, Calif., plant, E. W. Bliss Co.

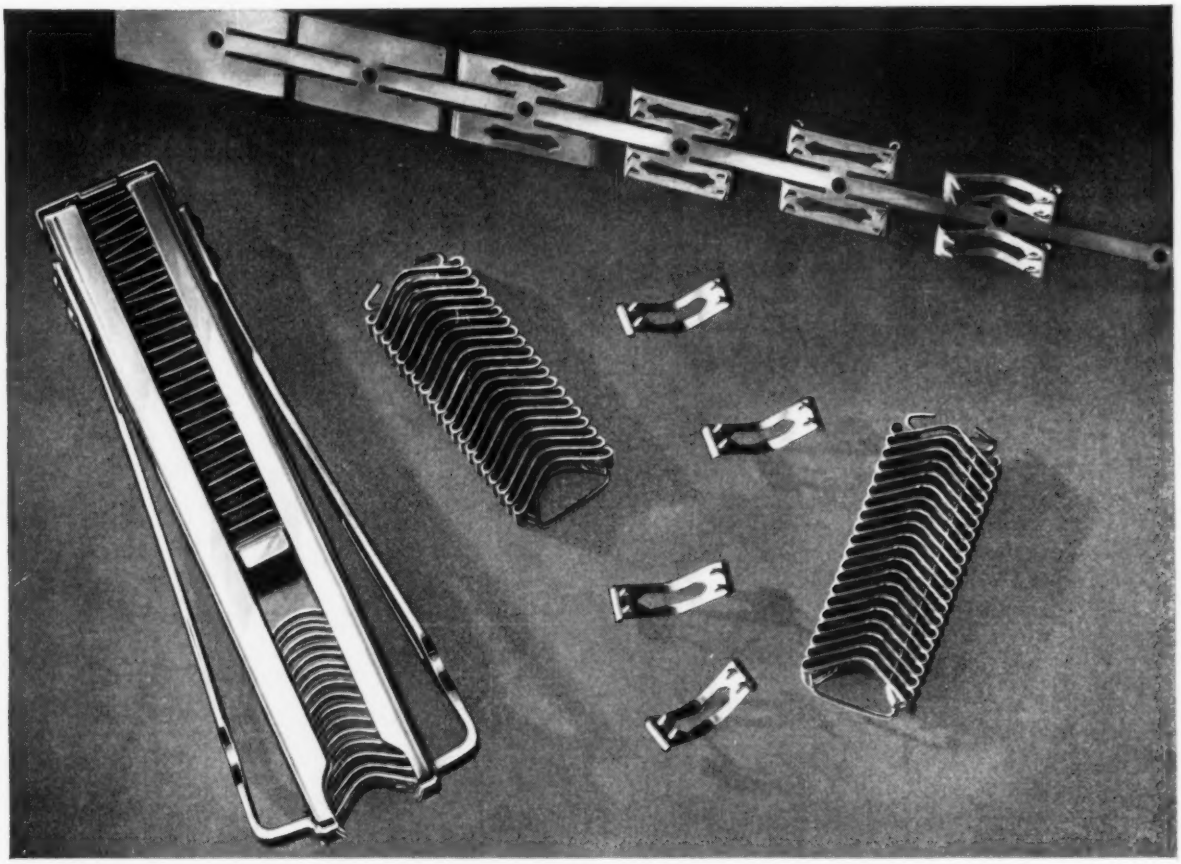
C. W. Leschenko, named field engineer, Pacific Coast Div., A. M. Byers Co.

Fred Lilienstein, appointed engineering supervisor, Advanced Development Laboratory, Perkin Engineering Corp., El Segundo, Calif.

R. H. Goodwin, appointed general sales manager, Electronic Wire & Cable Corp.

A. D. Bachtel, appointed superintendent, blooming and structural mills, Kaiser Steel Corp.

T. M. Wheeler, appointed asst. secretary - treasurer, Wesson Tool Co., Wesson Co. and Wesson Multicut Co.



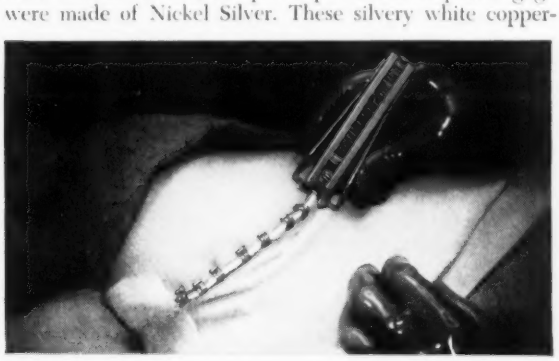
Above: The various steps in forming Autoclips® from Anaconda 18% Nickel Silver strip, .637" wide by .013" thick. Below are individual Autoclips and those mounted in wire holders ready for insertion in Autoclip Applier, at left. Exclusive wholesale distributor for Autoclip is Clay-Adams, Inc., New York City. ***Below, left:*** Autoclips being used to attach skin towel to edges of incision.

Anaconda Technical Service helped in

Selecting the exact Nickel Silver strip for this surgical clip

THE PROBLEM: The Technical Oil Tool Corporation, Los Angeles, developed Autoclip, an automatic magazine-type clip and applier to close wounds or incisions faster and easier. Selecting the right metal for the clip was the problem. A certain amount of tension was required to hold the wound edges together during healing, with the least amount of damage to tissues. In addition, the clip had to open easily for painless removal. The metal should be easy to form, and retain sharp, die-cut edges.

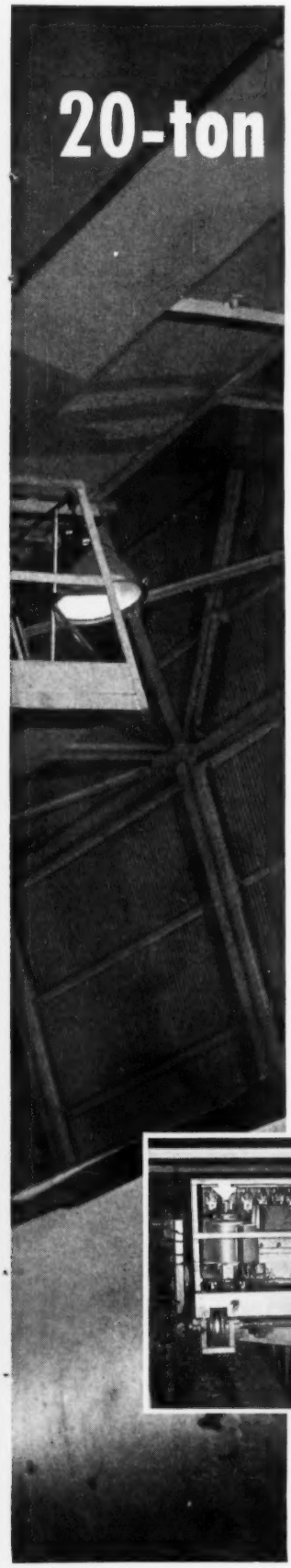
THE SOLUTION: After several unsuccessful attempts with various metals, sample clips of the required gage were made of Nickel Silver. These silvery white copper-alloys have excellent resistance to corrosion in service or in storage and have been time-tested for surgical instruments and equipment. Technical specialists of The American Brass Company suggested Nickel Silver, 18%-719—one of four standard Anaconda Nickel Silver Alloys—as the one best suited to meet all the requirements including tension, formability, clean edges and sharp points.



FREE TECHNICAL SERVICE: Metallurgists and technical specialists in The American Brass Company, through their day-to-day work with a great variety of metal problems, offer a tremendous breadth of experience. And this experience is at your disposal—to help you select the exact alloy, form, temper for your job. Call your American Brass Company representative, or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont.

ANACONDA®
COPPER, BRASS, BRONZE *and* NICKEL SILVER
Made by The American Brass Company

Westinghouse-equipped



20-ton crane built to work 60 minutes every hour

moving skelp loads at Jones & Laughlin's modern new tube mill

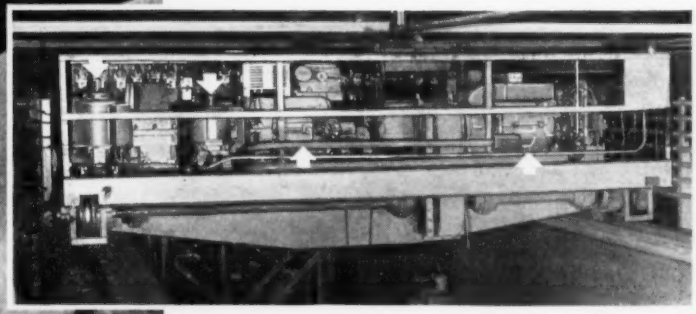
Outfitted with a C-hook, this new Movable Bridge Crane handles 9,250-pound coils of welded tube skelp, two at a time, in almost constant duty. Westinghouse silicone-insulated mill motors, fast-acting crane control and brakes are fully coordinated to give this unit the rugged stamina and positioning accuracy for continuous handling of big loads.

The low-inertia armature of the 600 Type MC mill motor assures quick response. Outstanding hoist control features an armature shunt point for light hook speed, *plus* an anti-cycling relay to prevent pumping in or out of the limit switch zone. Exclusive Westinghouse self-adjusting d-c magnetic brakes are used to assure positive braking when handling heavy loads. Westinghouse years of experience and engineering leadership have developed the industry's finest and most complete line of motors and controls for heavy-duty mill crane and hoist applications.

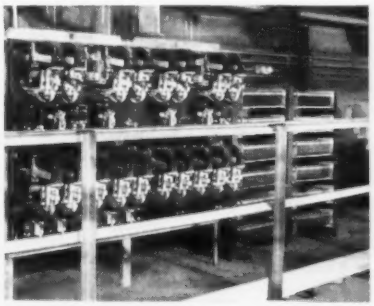
For all the facts, call your local Westinghouse sales engineer or write Westinghouse Electric Corporation, P. O. Box 868, 3 Gateway Center, Pittsburgh 30, Pennsylvania. J-22029

YOU CAN BE SURE...IF IT'S

Westinghouse



Crane is equipped with Westinghouse d-c mill motors to power bridge and trolley as well as the 20-ton main hoist and auxiliary 5-ton hook. Westinghouse SA brakes are completely self-adjusting—no adjustment or maintenance is ever necessary with wear.



Westinghouse Type M d-c contactors and AZ relays assure millions of trouble-free make-breaks for dependable service in continuous steel mill duty. Self-cleaning, knife-edge bearings guard against dust and dirt.

A Touch here achieved so much

CHARTING THE WAY TO THE STARS...

A new iridescent point of light flashing through our skies at night will proclaim man's most radical step since the invention of the wheel. The Earth Satellite will be on course, electronically compiling information that will enable man to chart his way to the stars.

The electronic equipment will be housed in a sphere 20 inches in diameter. The sphere will be made in two parts, from a magnesium alloy, deep-drawn after spraying with 'dag'® 41, a colloidal graphite dispersion. A thin film of colloidal graphite covers the pre-heated sheets before insertion in the drawing press.

Final contour is achieved by spraying the hemisphere again with 'dag' 41; then spinning under torch heating and wood tooling until the hemisphere assumes the shape of the spin block. Both hemisphere and spin block are coated with 'dag' 41 to facilitate removal.

'dag' 41 prevents galling, scoring and metal pickup; its ease of application, film strength, lubricity and resistance to heat make it the perfect deep-drawing lubricant. Talk with your Acheson Service Engineer soon, for more detailed information, and write for Bulletin 426—Metalworking Applications. Address Dept. IA-7.

dag®

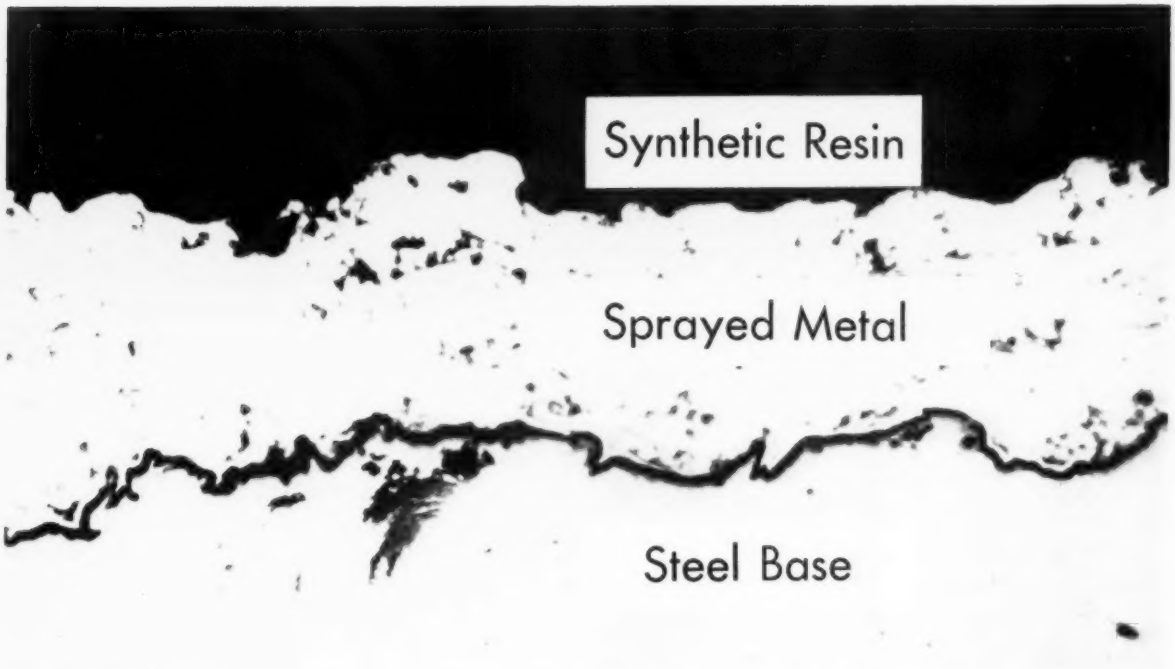
ACHESON COLLOIDS COMPANY

Port Huron, Michigan...also Acheson Colloids, Ltd., London, England

ACHESON COLLOIDAL DISPERSIONS:

Graphite · Molybdenum Disulfide · Zinc Oxide · Mica and other solids

Offices in: Boston · Chicago · Cleveland · Dayton · Detroit · Los Angeles Milwaukee · Philadelphia · New York · Pittsburgh · Rochester · St. Louis · Toronto



IT'S PLAIN TO SEE: Blast-cleaned steel surface grips dual coating of sprayed metal and synthetic resin tightly.

For Coatings That Last, Get Base Metals Clean

A freshly applied lining inside a steel tank or length of pipe usually looks good.

But will it last under critical service conditions?

Your money's worth in a tank lining depends primarily on one thing: proper surface preparation of the base metal.

By **S. J. Oechsle, Jr.**—Executive Vice President, and **K. G. LeFevre** Vice President, Protective Coatings Div., Metalweld, Inc., Philadelphia

▪ A coating won't adhere properly to a metallic surface unless the molecules of the coating and those of the metallic surface make intimate contact. That's just common sense. Yet, improper surface preparation is still responsible for case after case of coating failure, especially in the linings of tanks and other processing equipment.

There are three primary reasons why lining coatings fail when they're applied over improperly prepared surfaces: (1) adhesion loss, (2) osmotic blistering, and (3) under-film corrosion.

Loss of adhesion occurs when foreign matter prevents the lining from making direct contact with the base metal. Virtually any foreign material may be at fault. Mill scale, rust, old paint, dirt, grease, oil and chemical deposits are typical.

Chemicals Not Wanted—Osmotic blistering occurs if soluble salts or other water soluble chemicals remain on a surface when the lining is applied.

The more of these salts and chemicals trapped by the lining, the more the blistering condition will be aggravated and the quicker the coating system will fail totally.

Under-film corrosion is most often caused when the base metal

MAKE IT SMOOTH: Sharp edges of any kind, especially in welded areas, must be carefully ground before blast-cleaning is attempted.

THE FINAL TOUCH: Assured that no chemical residues lurk behind rivet heads, workman doffs shoes to spray a synthetic resin lining.

is attacked by chemicals that are trapped under the lining when it is applied.

Surface preparation to prevent these three types of coating failures isn't always just a case of doing a thorough cleaning job. Actually, proper surface preparation should begin with the original design of a vessel or any other component that is to be lined.

Keep Things Smooth—And the fundamental principle in designing process equipment for subsequent lining is this: Keep all areas that are to be lined as smooth as possible—eliminate all possible sharp edges and discontinuities.

The reason is that linings applied in liquid form tend to flow out or away from discontinuities such as weld spatter, weld undercuts or other sharp edges. Where a nominal 0.008-in. thick lining is the goal, it's reasonable to expect that not more than 0.001 in. will adhere over any unground edges.

Cracks, pinholes, sharp corners and even the line of contact between two pieces of metal are always potential trouble spots. They're areas that linings can bridge, and the bridging action can trap air, moisture and other unknown elements underneath.

Of course, areas that cannot be reached cannot be properly lined. Examples are angles placed to back, or structures skip-welded over a plate.

Follow the Rules — Thus the principle of designing for smoothness in anticipation of a subsequent lining is all-important. To insure the best results, there are some simple guides and check points that designers should bear in mind.

For example, butt-welded vessels are preferable to lap-welded or riveted types. Also, flanged and dished heads are better than flat ones. Outlets, too, should be both flanged and oversize. And self-supporting umbrella or elliptical roofs are always best for lined storage vessels.

Tubular Columns Best—Then, too, where internal columns must be used, good design for lining purposes calls for a minimum number. Moreover, such columns should be tubular in shape. And, as an added precaution against internal pockets or crevices, all stiffening members should be outside the vessel.

Careful design will also avoid the interior use of structural members such as angles and channels placed back to back or lying flat against the walls.

Where welds are concerned, it's important to specify that (1) all spatter and flux be removed; (2) all welds be free of undercuts, cracks and pinholes; (3) all welds be ground suitably smooth for the lining that will be applied.

Not Cure-Alls—Each of the foregoing design guides is practical in itself. However, it's not always possible to embody all of them in the fabrication of new equipment. This being true, it's even more difficult to apply them in a great many cases where existing tanks or vessels must be relined.

For such jobs, seal welding is often a useful technique. Apply it

to back-to-back channels and angles and to all internal stiffeners wherever they touch other metal. Apply it also to all internal and external lap welds.

It's important, however, that seal welding be done quickly and at the lowest possible temperature to avoid distortion effects that might magnify stress corrosion problems. Here, too, all weld spatter and flux must be removed, and welds themselves must be ground smooth. Similarly, any other sharp edges should be ground to at least 1/32 in. radius.

Mastics Need Care—Mastics for filling cracks and fillets must be compatible with the subsequent lining and applied with care as per manufacturer's instructions.

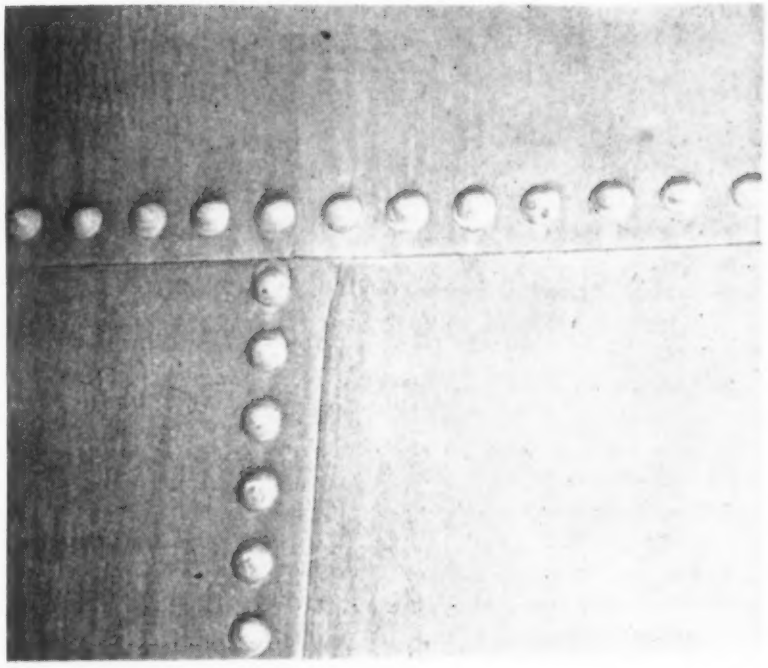
Any job of relining a riveted tank should be approached with caution. It's possible that tight caulking of rivets and overlapping joints may be satisfactory as a surface preparation. Often, however, the "hats" on rivets and the discontinuities on laps —particularly where three joints come together—present a crevice condition unacceptable to the lining.

Attempting to do a "patch" job by ringing the rivets with weld material and seal-welding the laps usually means that it's necessary to do the whole tank. This can lead to other problems, because of the localized distortion involved. Use of a mastic or sprayed metal can sometimes minimize this problem.

Blast Comes Next—Still, careful attention to either the original or revamped design of vessels to be lined with protective coatings is just one phase of surface preparation. Beyond this, the base metal must also be blasted clean so that the coating will adhere properly.

There are three accepted specifications for sand blasted steel. The most critical one calls for a "white metal" finish. It requires complete removal of all mill scale, rust, paint or other foreign matter until the surface is a uniform gray-white color.

Next most critical is a "commercial" finish, which specifies the re-



THESE ARE TRICKY: Rivets and seams are potential trouble spots. Good design seeks to avoid all crevices, pockets and sharp edges. However, tight caulking of rivets and overlapping joints may work satisfactorily.

Blast Cleaning Rate for "White Metal" Finish on Steel (90 psi air pressure)

Original Surface	Sq Ft per Hr (Nozzle Size 5/16 in.)	Lb per Sq Ft of Abrasive Required
Tight mill scale, no rust	100	12
Weathered, loose mill scale, fine rust, no pits	120	10
Weathered, no mill scale, rust, some pits	112	10.7
Old, severe pitting	60	20
Thin former lining, small percentage of breakdown	70	17
Thin former lining, overall breakdown	80	15
Former sheet lining removed, some adhesive remaining	50	24

Peak-to-Valley Etch Depth With Various Abrasives (90 psi. air pressure, 3/8 in. nozzle)

Abrasive	Passes Through	Etch Depth (In.)
Sand	40 mesh	0.0019
Sand	18 mesh	0.0025
Sand	12 mesh	0.0028
Steel Grit	25 mesh	0.0033
Steel Grit	18 mesh	0.0036
Steel Grit	16 mesh	0.004
Steel Grit	12 mesh	0.008

To Blast-Clean a Metal Surface Properly

1. Don't start blasting until all welding and other work is done.

2. Grind welds smooth, remove all spatter and flux.

3. Remove all contaminants before blasting, if possible.

4. Make sure the vessel is dry before blasting.

5. Dispose of contaminated sand after one pass.

6. Keep humidity below 50 pct while blast-cleaning.

7. Keep compressed air supply free of water and oil.

8. Dry and re-screen abrasive particles before re-use.

9. Avoid touching cleaned surfaces with bare hands.

10. Provide enough air for the size of nozzle used.

11. Prime-coat all blasted surfaces the same day.

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moval of all corrosion products, as well as mill scale. It does not include removal of the gray oxide binder between the scale and the base steel. Thus the finished surface is gray and looks rather streaky.

Must Provide "Anchor"—A simple "brush-off" blast involves only the removal of loose mill scale, rust and paint. However, remaining foreign matter must be tightly adherent, and the surface sufficiently abraded to provide a pattern for anchoring the coating to be applied.

A thoroughly clean and well-abraded "white metal" surface is imperative where linings are slated for complete immersion in service. A slight compromise in the direction of a "commercial" finish may sometimes be allowed on areas that will be exposed to concentrated vapor, or to spilled liquids.

As a rule of thumb the depth of the etched surface, measured from the highest peak to the lowest valley, should not exceed one-third of the final thickness of the lining.

How's The Surface?—Choice of the blasting media depends on the surface involved. This can range from steel with tight mill scale and no rust (new material) to metal with the former sheet lining removed and some adhesive still remaining.

Regardless of the choice of abrasive for proper cleaning of the metal surface, there are also certain required items of blasting equipment. They include an adequate air supply, a pressure type sandblast pot, proper-size hoses, adequate ventilation and good lighting.

Among the types of blasting media, natural silica sand is most commonly used for outside work where recovery of the abrasive is impossible. However, the sand particles may lack angularity, and the bulk material may contain alkaline constituents which will break up and adhere to the metal surface.

Flint Often Used—Crushed flint or "chat" is used extensively to blast surfaces prior to metallizing them. Angularity of particles is excellent due to the characteristic conchoidal manner in which flint fractures. High-purity material often remains imbedded in the metal surface, however.

Crushed slag is comparatively new, but is gaining acceptance as a material for blasting metal surfaces clean. It is extremely angular and has a low breakdown rate, but it does leave some particles imbedded in the surface. Nevertheless, tests show it to be completely inert from a corrosion standpoint.

Angular steel grit is widely used where recovery is practical. It can be sized to give almost any desired degree of etch, and it leaves nothing on the surface of the workpiece.

Needs More Cleaning—Surprisingly enough, a blast-etched surface may still require meticulous cleaning before the first coat of a proposed lining can be applied. Even though the surface is brought down to a "gray" condition, vessels to be relined may still have stubborn traces of sulphide or paraffin.

Sulphide removal involves allowing time enough for oxidation, combined with water washing. Removal of paraffin usually calls for solvent cleaning and reblasting. If traces of acid remain from former service, a strong alkali neutralizing treatment should follow blast cleaning.

If there are no traces of chemical residue remaining after blast-cleaning, it's usually sufficient to clean the metal surfaces, plus any rigging or scaffolding, with an industrial vacuum cleaner. Surfaces to be prime coated should then be wiped with a clean white cloth until the cloth shows no discoloration.

Brush First Coat—Accepted practice also calls for brushing on the first coat of a new lining even though subsequent coats will be sprayed. The theory is that any minute specks of dirt left on the surface will mix with the brushed-on prime coat. Thus they will not be trapped in tiny crevices and bridged over by additional coats.

Both surface preparation and actual application of a tank lining should be the responsibility of a single contractor. Shipping a freshly blasted and cleaned vessel to another plant for a coating treatment is unwise.

The main reason is that adverse weather conditions or delays in shipment might cause pickup of rust and dirt all over again. Sound practice calls for blast cleaning and priming to be done on the same day. It's added insurance that the lining will do what's expected of it —go on smoothly and give maximum service life.

If the job should be split into two separate contracts, the firm that applies the lining has an ultimate responsibility. This is to see that no work is done on surfaces that will be detrimental to the life of the coating.

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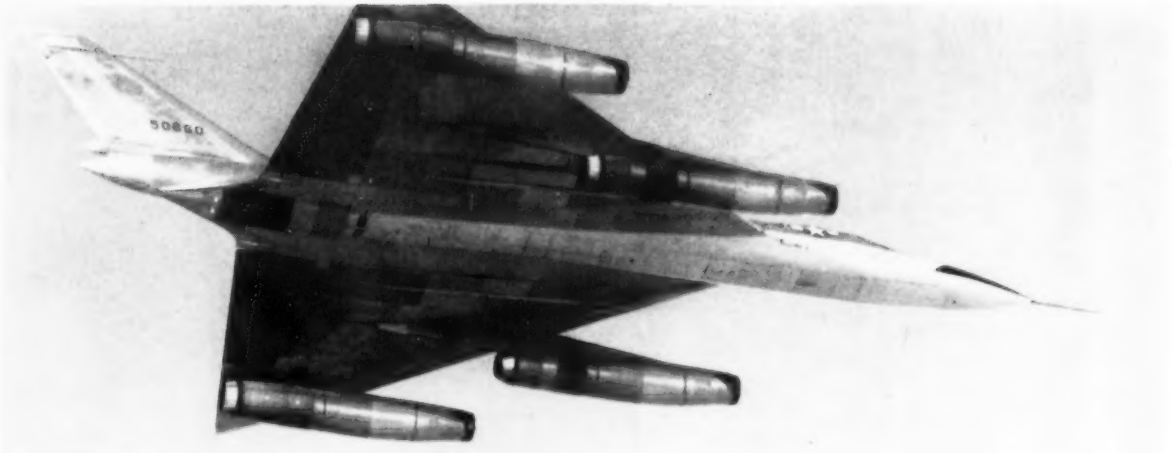


HYPERSONIC JET: Brazed 17-7 PH honeycomb panels are used extensively on Convair's speedy new B-58.

How To Make 17-7 PH Honeycomb Panels

Lightweight, high - strength honeycomb panels of 17-7 PH stainless are now being turned out in routine production.

A large number are currently finding use on one of America's newest jet bombers.

But this is only the beginning: increasing aircraft and missile speeds will require a lot more of the same.

Here's how they're made.

By **P. M. Allen**—Research Engineer, Armco Steel Corp., Middletown, O.

■ For high strength coupled with light weight, honeycomb cellular structures can hardly be beat. Panels made by bonding aluminum, fiberglas and other core materials to various kinds of outer skins have opened new design vistas for aircraft flying in the subsonic and lower supersonic speed ranges. Cores for these structures were made by bonding formed strips together to make square or hexagonal cellular configurations. Other types were made with foamed plastics between the outer skins.

As speeds and operating temperatures increased, strength limitations of both the bonding and the structural materials were exceeded. New materials and new methods of attaching cores to skins had to be found.

One of the more successful to date is Armco 17-7 PH, a precipitation-hardening stainless steel containing 0.07 pct C, 17 pct Cr, 7 pct Ni and 1.20 pct Al. Honeycomb panels with core and skin both made of this alloy are being used on Convair's B-58 Hustler supersonic bomber.

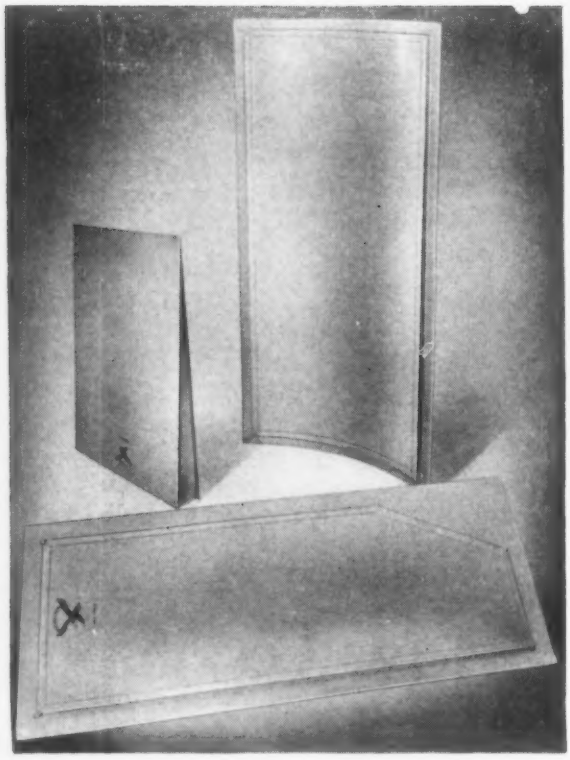
Offers High Strength — Among its advantages, it can be heat-treated to room temperature tensiles in excess of 200,000 psi; it retains good strength up to 900 F; and it's available in large quantities in all gages, including thin strip.

Properties of 17-7 PH permit making cores from strip 0.001 to 0.003 in. thick, and some skins from strip as light as 0.005 in.

Suitable methods had to be developed for attaching the thin cores to the thin skins. Brazing showed the most promise for developing maximum structural strength up to 900 F. But many new problems were created by the need for bright brazing, brazing temperatures that would be compatible with heat treatment, thinness of the steel being brazed, and the very rigid flatness or contour requirements of the finished panels. Here are the basic techniques that finally evolved.

Good Joints Are Important — First, the core is machined to make contoured and tapered shapes. Cores for flat panels are also "shaved" to provide joint clearances within 0.001 in. between core and skin.

A number of methods are in gen-



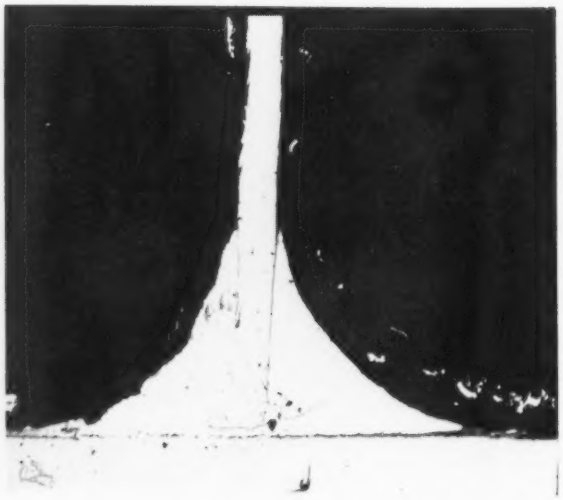


FIG. 1: Brazing alloy containing 85 pct silver and 15 pct manganese tightly bonds the honeycomb structure to the panel skin. Magnification 125x.

LEFT: These typical honeycomb panels for the B-58 have core walls 0.0015 in. thick. Most cover sheets are 0.010 in. thick. All sheet and strip components are of 17-7 PH stainless steel.

eral use for machining or cutting the core. The Anocut process and one developed by Convair have both proved satisfactory.

Cleaning is the last important step before cores and skins are assembled for brazing. All traces of dirt, grease and fingerprints must be removed.

Organic solvents remove grease and oils, but are not fully effective for fingerprints and dirt. A mixture of 10 pct nitric and 2 pct hydrofluoric acid solution is often used at 120° to 140°F. Immersion is limited to one minute or less to prevent more than very light etching of the stainless steel. This is followed by thorough rinsing to remove corrosive fluorides.

Etching can be reduced by decreasing time, temperature and acid concentration, or by substituting sodium fluoride for hydrofluoric acid. It's important that cores and skins are not contaminated after cleaning.

Requires Good Fixtures—Quality of the finished panels depends on well-engineered fixtures. Brazing fixtures must have good thermal conductivity, resistance to thermal shock in all sizes, and ability to hold flatness or contours during use and for many brazing cycles.

Metal fixtures of various compositions and designs have been tried, but excessive warpage during heating and cooling makes them unsuitable.

Graphite has proved satisfactory. Although direct contact with the honeycomb panel might carburize the steel, this can be avoided by using disposable low-carbon stainless steel slip-sheets between the graphite and the panel skin.

Gas Impurities Oxidize—As to atmospheres, helium and argon have been found best for bright-brazing 17-7 PH honeycomb panels. Because oxide films adversely affect joint quality, use of oxygen-free grades is essential. Water vapor can be reduced to a dew point of —60°F or lower by passing the gas through dryers before it enters the work chamber.

Carbonaceous gases might be formed through reactions of other gases and materials present in the brazing furnace, or through breakdown of materials by heat.

Carburization may also occur from contact with carbon or carbon-containing materials through diffusion. Besides graphite, these sources include grease, oil or dirt remaining from improperly cleaned core or skin; organic adhesives used in bonding cores, and adhesives used

TABLE I

Effect of Carbon Pickup on Hardness of 17-7 PH

Carbon, Pct	Hardness (Condition TH 950)
0.062	45 RC
0.085	39 RC
0.096	31 RC
0.13	93 RB

to pre-place granular brazing alloys; and carbon steel retorts or fixtures.

Lowers Hardness—Regardless of how carburization occurs, it can be detrimental to the mechanical properties of heat-treated 17-7 PH. Table I shows the effect on hardness of 17-7 PH samples that were carburized. Nitriding can also have this undesirable affect.

Minimum dew points necessary for brazing vary with temperature. In the temperature range of 1850° to 2000°F, dew points of —50°F and lower are used. Lower temperatures require lower dew points.

At temperatures below 1650° to 1700°F, it's hard to get a satisfactory braze without using a flux. Inability to reach and hold low enough dew points, occluded oxygen on the surface of the work and work chamber, and the extremely thin oxide film on the surface of stainless steel may all be contributing factors at these lower temperatures.

Drying agents such as sova beads, silica gel and activated alumina can be used. All these are easily reactivated. Molecular Sieve #4 is also reported to be a good drying agent.

Brazing Alloys—A number of different brazing alloys have been tried. Until recently, silver-base alloys containing 85 pct Ag and 15 pct Mn were the choice; Fig. 1 shows a panel joint brazed with this alloy. But since there's a possibility of crevice corrosion with the 85 Ag-15 Mn alloy, a 93 pct Ag, 7 pct Cu alloy containing lithium is finding more favor.

Lithium additions act as a flux, improving both flow and wetting. So far, no harmful effects on the base metal have been found. Some other variations of silver and copper, with and without lithium, are currently being investigated.

Boron-containing alloys and pure copper are unsuitable for brazing 17-7 PH honeycomb panels because of excessive penetration.

Brazing of assembled panels is done both in furnaces with metal retorts and in conventional furnaces with the work enclosed in welded boxes. Dew points low enough to properly braze stainless steel in the absence of fluxes can't be maintained in a brick-lined furnace.

Boxes Are Best—Faster heating and cooling rates are possible when panels are enclosed in boxes. When this practice is used, tubes for introducing the argon or helium atmosphere are welded to the boxes. Best results are obtained by leaving the work in the box after removal from the furnace until a temperature of 300°F or lower is reached.

Armco 17-7 PH is normally heat-treated to either Condition TH 1050 or RH 950. These conditions are obtained by heat-treating Condition A (annealed) material as follows:

To obtain Condition TH 1050, heat at 1400°F ± 25°F for 90 minutes; cool to 60°F plus zero minus 10°F within one hour and hold 30 minutes; then reheat to 1050°F ± 10°F for 90 minutes and air cool.

To obtain Condition RH 950, heat at 1750°F ± 15°F for 10 minutes and air cool; cool to —100°F and hold 8 hours; then heat at 950°F ± 10°F for 60 minutes and air cool.

Modified Treatment — Certain modifications of these heat treatments have been made for brazed honeycomb panels. The first heat treatment can be done during the cooling portion of the brazing cycle in this way: Cool to approximately 1400°F and hold for 30 to 90 minutes; cool to 0°F or below and hold 8 hours; reheat to 1050°F ± 10°F, hold 90 minutes, then air cool. A net expansion of approximately 0.0040 in./in. occurs during heat treatment. When cutting pieces in Condition A to size, compensation has to be made for this amount of growth.

Hardening at 1050°F is generally done in atmosphere to minimize surface oxidation.

Edge compression and beam shear properties obtained on test pieces cut from heat-treated 17-7 PH honeycomb panels are shown in Table II. These results were obtained from tests run at room temperature.

TABLE II Typical Mechanical Properties of Brazed 17-7 PH Honeycomb Sandwich

Core	Thickness of Facings	Edge Compression Strength at Failure, psi	Beam Shear Strength at Failure, psi
0.500 in. thick sandwich 3/16 in. cell .0015 thick foil	0.010	169,000	684
Same as above	0.018	207,000	670
0.700 in. thick sandwich ¼ in. cell 0.002 in. thick foil	0.018	219,000	900

Data courtesy of Aeronca Manufacturing Co.

Automatic Spray Boosts Core Mold Output

Say you want to expand production. What happens when an operation depends on manual skill?

It doesn't pay off just to increase manpower.

Here's the time to see what automatic devices can do to improve operating techniques.

▪ Production of cast iron pipe and fittings is a multiple operation. Rate of output depends on speeding up each individual operation.

Making of core molds for the casting of the pipe has been a traditional bottleneck. So it was at the plant of James B. Clow & Sons, Inc., Coshocton, O.

That is until automatic operation took over to put spraying on an efficient basis. It lifted production in this operation 200%.

Automatic Team — Automatic spray equipment made by the Binks Manufacturing Co., Chicago, teams with automatic core blowers to speed the coremaking operation and reduce labor cost. In addition, the quality of the cores and, consequently, of the pipe has reached a new high.

It's due to uniform application of the coat used to seal the cores against metal penetration. Previously, the cores were sprayed by hand.

The Binks spray painting facilities include two standard dry bench-type spray booths, complete with turntables; four model 21 automatic spray guns; and a 30 gallon pressure tank with agitator. The system has a three-way air valve which regulates the length of the spray application.

Manpower Cut—Prior to automation, ten men performed the core making operation, five hand ramming and three spraying. Today, two men do the job, each performing the double function of operating one spray booth and one core blower.

The equipment blows and sprays 200 six-inch cores every hour. Production could be pushed higher if necessary. The present production rate is dictated by the capacity of the dielectric baking ovens used to bake the cores after blowing and spraying.

The automatic core-making equipment has proved so productive that it is now employed only on the second shift. In the hours between 3:00 P.M. and midnight, the two core-department workers produce enough cores to supply the plant's pipe department for both shifts. This is an important factor in the daily production of 500 tons of centrifugally spun cast iron pressure pipe.

Seal Is Vital—The cores get the coating after they have been blown. The sealing fluid is Krome-Kote, being a compounded core wash, mixed with water to 43 Be.

The fluid gets mixed in the 30-gal pressure tank which serves both spray booths. The fluid pressure in the mixing tank is 12 psi.

The porous nature of the sand used in the cores is the reason for sealing. Without a seal, the molten metal would penetrate the voids in the sand. The automatic spray of Krome-Kote produces a coating strong enough to prevent metal penetration, yet thin enough to maintain the dimensions of the core.

Sand Under Pressure—First step in the core-making process entails feeding the green sand into the top of the automatic core blower. The blower in turn air-blows the sand under 90-lb. pressure into the core box.

The operator removes the core and places it on a turntable in the Binks spray booth. A pinion gear, actuated by an air-driven rack gear, turns the turntable.

After the turntable completes a set number of revolutions, a dog on the rack gear pushes a plunger to set the automatic spray guns in action. Valves at the tank keep the nozzle pressure at 35 psi.

Fast Cycle—At maximum speed, it takes six seconds from the time the operator actuates the three-way valve to spray a core. When the core is completely coated, the Binks air valve automatically closes to shut off the spray gun.

The coremaker places the core on a large conveyor belt for transfer to the dielectric oven for baking. Two dielectric ovens are used to bake the cores. As the cores move into the oven, they receive a fine spray of water from a series of nozzles mounted just above the oven's mouth.

The water aids the baking process by increasing electrical conductivity. In the ovens, the cores are baked for about five minutes at temperatures up to 212°F.

As they leave the oven, the baked cores are removed from the conveyor belt by hand and stacked on pallets to be moved to the casting area for use in the centrifugal casting machines.

Cores Lock In Place — Steel back-up plates and keys lock the core in the bell end of the casting machine. The machine then moves toward the pouring trough. Molten iron flows into the opening between the core and the mold.

The pipe forms as the mold travels to the starting position. Centrifugal force holds the molten iron in place. The core shapes the inside bell contour at one end of the pipe.

As the pipe mold revolves in water inside the casting machine, the molten iron cools quickly. The pipe, when strong enough for handling, is extracted from the machine. The core sand is brushed out of the bell.

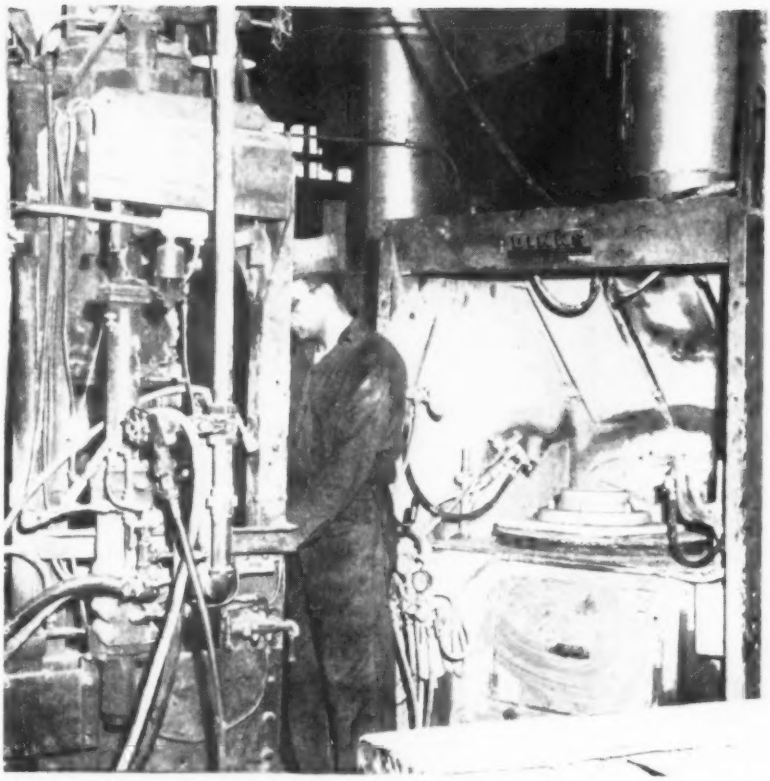
Check Quality — An overhead crane then carries the pipe length to an annealing oven. After annealing the pipe goes through cleaning and bituminous dip processes. The finished pipe gets final inspection and hydrostatic test.

The past procedure was for one man to blow the core, then to place it on a small turntable where another man would apply the coating with hand spray guns. The turntable was operated manually, with the operator holding one spray gun leaving the other free to operate the turntable.

Comparison Shows—Hand spraying had a lot of drawbacks. The coating was not always uniform. It often flowed from the vertical to the horizontal part of the core and dried in ridges. These ridges would crack during baking, clogging the filters.

To make a success of this system, it was essential that the spray operators be expert at their job. Unfortunately, this was not often the case. Frequently only one man in eight could produce the outstanding job that hand spraying the cores required. But even skilled operators can't always get consistent results.

The present Binks automatic spray system has eliminated these problems. Automatic spraying provides smooth, even coatings, without excess overspray. In providing increased production, reduced labor costs, and improved quality control, the automatic spray facilities have put the pipe-casting operation on a modernized, peak-efficiency basis.



COREMAKERS DELIGHT: It's no longer left to chance. Coremaker can tend to core blower while core in booth goes through short cycle.

UNIFORM COATING: Quality of coating is vital in performance of core. Conveyor leads to baking oven. Fine spray of water aids baking.

Does Simplified Drafting Really Cut Costs?

By H. Egerer—Project Design Engineer, Omaha Steel Works, Omaha, Neb.

There's a story behind this article.

Mr. Egerer wrote it after reading "How to Simplify Engineering Drawings," which appeared in The IRON AGE for December 27, 1956.

He agrees that simplified drawings can save time and money in many instances. But he cautions against wholesale applications of the technique. He points out that there are times when simplified drawings might actually boost your costs.

We think his views on this timely subject will be of interest to many of our readers.—

The Editors

▪ As the means for transmitting a product designer's ideas to the production department, an engineering drawing is an important document. As with other documents of importance, the drawing should be accurate, precise, clean and outstanding in its clarity of meaning.

WHAT PRICE SIMPLICITY? Unseen savings can stem from a draftsman's sense of accomplishment in making a good engineering drawing.

Without a doubt, simplification has its place in the preparation of engineering drawings. There are many cases where the practice can save time and money.

On the other hand, there is no question that overly elaborate drawings are wasteful of time, money and effort.

This doesn't mean that an all-out drive should be made to simplify through a reorganization of the drawing system and methods of drafting. Any swing toward simplification calls for caution; there are many hazards involved.

Avoid Extremes—Actually, as in many comparable situations, it is wise to try to take the middle road between elaboration and simplification. But no one middle-of-the-road solution is apt to fit all cases. Some procedures will be more advantageous than others in particular situations.

The best solution for a given problem stems from an overall view of the situation. Where engineering drawings are concerned, the important thing is that they must convey the ideas of engineers and designers to production personnel.

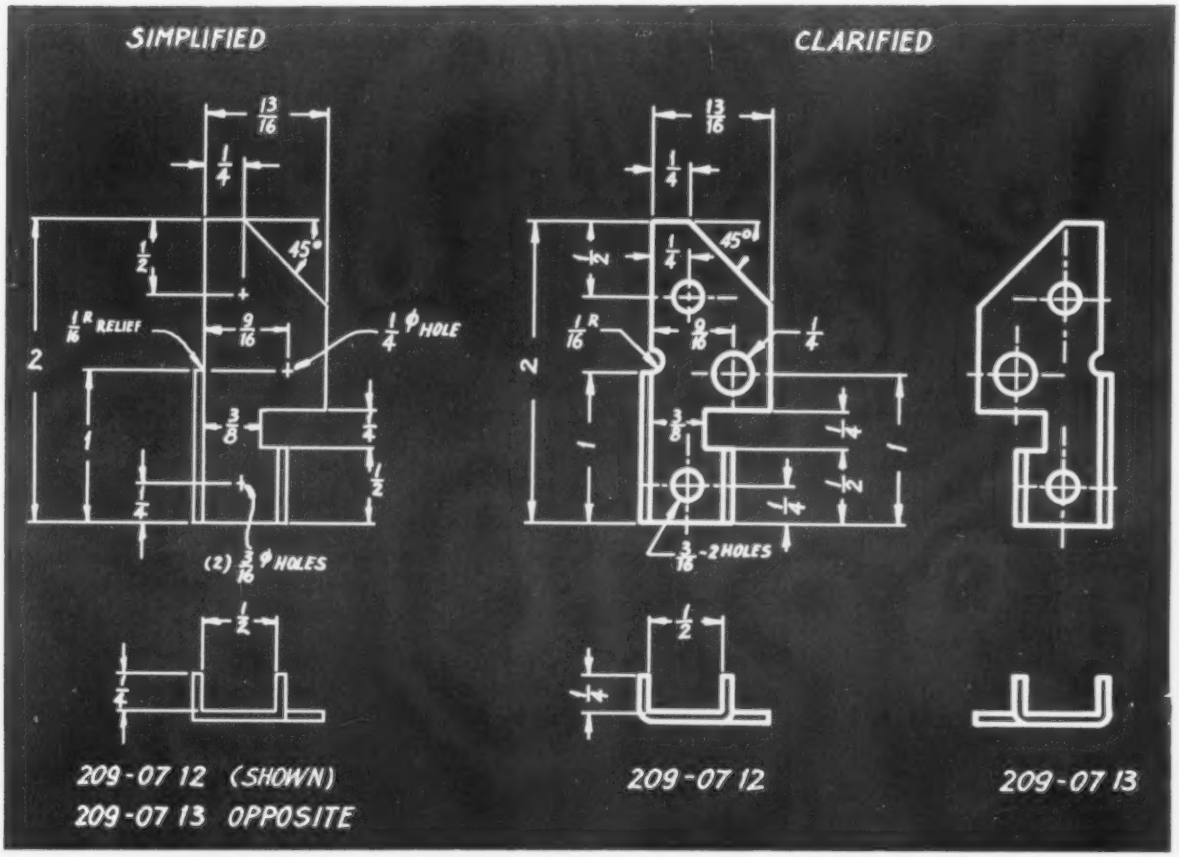
Consider Worker Ability—Moreover, in conveying these ideas, drawings must be clearly and readily understandable to production workers. Such people are often not as skilled as those who originate the ideas. Because a drawing is the first step in materializing an idea, money spent to do a good job at this stage is wisely invested.

Assume that $2000 has been spent to develop the design for a metal part, and that another $2000 will be required for production tooling. Assume also that a simplified drawing of the part will cost $100. Surely the investment of $120 to make a thoroughly clear drawing can be justified.

Take Overall View—Considering the drawing alone, the simplified version costs 20 pct less. But viewed in the light of the overall cost of preparation for manufacturing, the saving is only 0.5 pct. By the same token, the chance of losing money with the simplified drawing is much greater than the saving realized thereby.

Errors due to either misreading or misinterpreting a simplified drawing can be very costly. Time spent by production personnel in consulting draftsmen or engineers about such drawings can skyrocket, also.

Granted that simplified drawings often mean direct savings. But the indirect savings that accrue when people have reference to neat and complete drawings at all times should not be disregarded.



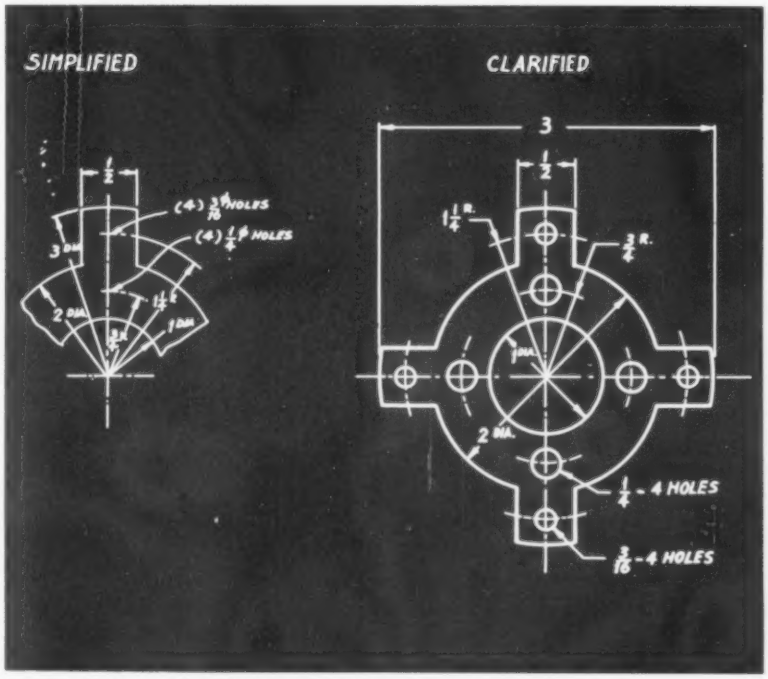
TAKE YOUR PICK: For right and left-hand parts, a "clarified" drawing (right) is preferable to the "simplified."

The Real Picture—Many shops find it difficult to keep personnel working with drawings. This problem can often be eliminated with clarified drawings that represent the real picture of a product and are pleasant to look at as well.

Consider the draftsman too. Although there is no place for "art work" in an engineering drawing, the draftsman who turns out a good job has a real sense of accomplishment. It's not illogical to assume that a prideful worker is more likely to be an efficient one. In this sense he's a source of savings.

Last, but by no means least, a clarified (not elaborate) drawing in the hands of a customer can be an impressive calling card and a highly valuable advertisement.

The drawing should do a complete job. To pick up all the information lacking from a drawing may, in the long run, cost more than the original complete drawing.



A CLEARER CONCEPT: A full-scale "clarified" view of a stamping provides a better idea of part size and amount of material needed.

New Furnaces Treat Giant Forgings and Extrusions

By R. R. LaPelle—Manager, Pacific Branch, Industrial Heating Division, Westinghouse Electric Corp., San Francisco.

Unitized construction means higher strength per weight ratio. Assembly is faster too.

So it is with aluminum construction in aircraft.

It takes greater capacity in press equipment. But it also calls for furnaces that can handle the larger sizes.

▪ Advances in supersonic flight bring on new techniques in aircraft construction. Air Force designers, realizing the limitations of riveting and welding, have gone in for large forgings and extrusions.

It calls for forging and extrusion presses of greater capacity than ever before. Selected plants have erected such facilities to do the job.

Whenever you increase size and capacity of forging and extrusion equipment, the supporting equipment must also keep pace. So it is at Harvey Aluminum Co., Torrance, Calif., the one plant participating in both the forging and extrusion phases of the program.

The new equipment at the plant includes two extrusion presses, rated at 8000 and 12,000 tons, and a battery of hydraulic forging presses, one an 8000-ton unit. Extra-large furnaces had to be built to support the program.

Ingot Homogenizing—Take the case of large ingots cast by the DC casting technique. To work them, it calls for thermal treatment to break up the large grain structure and to disperse alloying elements uniformly through the material.

It's done in two large car-type furnaces. Each furnace car consists of a heavy structural steel frame topped with insulating refractory material.

The loading area is 15 by 30 ft with 7 ft height. The cars carry the ingots on steel racks which space the ingots to permit circulation of air. Maximum capacity per charge is 225,000 lb.

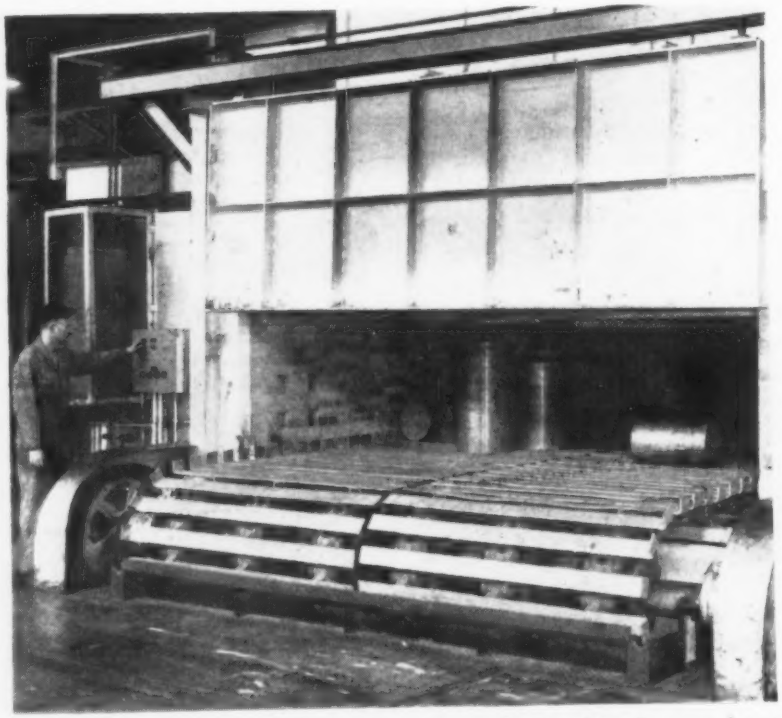
High Volume Air—Heating takes place by blowing a large volume of air horizontally across the car. It's controlled by baffles on each side of the furnace. Gas fired heaters located on top of the furnace heat the air.

Each of three zones in the furnace has a capacity of 3,500,000 Btu with a 44,000 cfpm recirculating fan.

A recording and controlling pyrometer controls each zone to within 10°F with normal loads. An additional recording pyrometer records load temperatures with portable thermocouples buried in the charge.

Cycle Adjusts — Soaking time and process temperature can both be adjusted to meet requirements. Size of billets and alloy composition are factors in choosing cycle.

The operator rides the transfer car, from which he can control the motion of the furnace cars.



BILLET HEATING: Charging end of the gas-fired preheat furnace shows slat-type continuous conveyor.

The furnace doors are operated by means of electric motors with controls within reach of the operator in the transfer car cab.

Billet Heating — Conveyor-type preheat furnaces heat billets for the hydraulic forging presses. The slat conveyors have an area of 12 ft by 31 ft 8 in. inside the furnace. The loading height is 3 ft above the top of the conveyor.

The conveyor consists of flat-top cross bars carried upon multiple strands of heavy roller chain. It's divided into halves longitudinally. Either half may be run separately or both may be run together.

Hot air feeds from behind baffles on both sides as well as from below the conveyor. Recirculating air leaves through the top of the furnace and passes to heaters located in the furnace roof.

Two Control Zones—Each of two separate control zones are provided with a 2 million Btu direct gas fired heater. The two recirculating fans for each control zone handle a total of 54,000 cfpm.

Recording controlling pyrometers read the air temperature in contact with work.

The furnace doors of the billet heaters are operated by air cylinders. The conveyors may be run in either direction.

Heat Treating — The extrusion presses turn out extrusions of such size that two large vertical heat-treating furnaces have been built to take care of the output.

The larger of the two is capable of handling extrusions 80 ft or longer. The overall height of the furnace is 106 ft 2½ in. above floor level.

The quench pit extends 110 ft below floor level. The furnace rates at 1020 kw.

Control By Volume—In such a large furnace, not only larger in diameter but higher than any previously built, there's a problem of controlling temperature uniformity. It's solved by high volume of recirculating air and careful positioning of heating elements and baffles.

This prevents the possibility of cold spots at the extreme ends of the charge. The saturable core reactor type control gives a continuous and variable control over the heat input. A total of 55,000 cfpm is circulated over the work.

The smaller of the two furnaces takes extrusions 44 ft long. It's rated at 750 kw.

Easy Handling—For each vertical furnace the operating features are similar.

The extrusions are hung from an alloy spider or rack at floor level. The overhead crane upends the rack and lowers it into the quench tank located directly beneath the furnace structure.

Here the load is transferred to a swinging jib-boom arm. The furnace door is moved sideways out from under the furnace. A hoist hook inside the unit raises the load inside the furnace.

Fast Heating—High velocity air passes over the load to the bottom of the structure. The load rapidly comes to temperature.

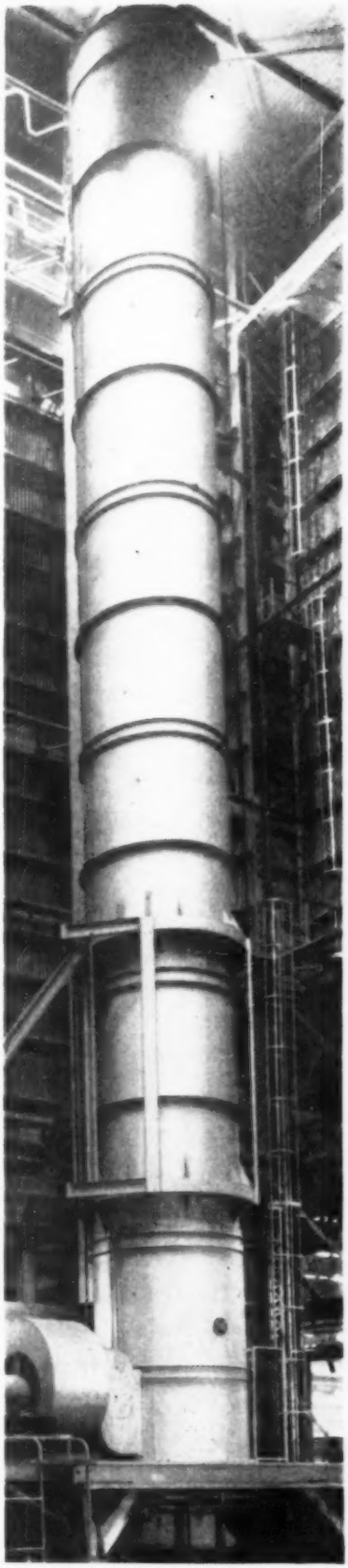
Heating elements, located along the entire sidewall of the furnace, reheat the air, as it returns to the top of the furnace behind baffles.

A multiple-point recorder records the temperature through thermocouples attached to the workload.

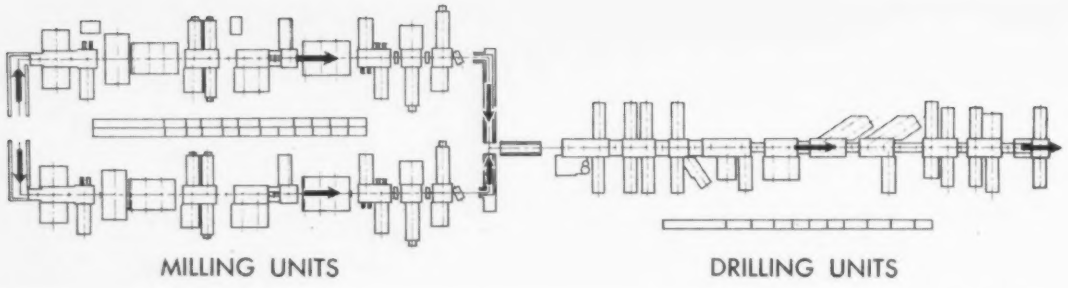
Easy Quenching—The load is lowered rapidly after heat-treatment into the quench pit below the furnace structure. Quenching is completed rapidly to insure maximum physical properties.

The hoist unit is of variable voltage type. It lowers the load at a constant rate in spite of the fact that the buoyancy of the water displaced reduces the load.

The uniform rate of quenching maintains straightness as well as the physical properties desired.



GIANT HEAT TREAT: As tall as a 10-story building, this giant handles 80-ft extrusions. Quench pits extend below floor level.



TRANSFER LINE: Intake manifold line is made up of two identical milling sections and one drilling unit.

Automation Devices Give Flexibility to Transfer Line

Considerable flexibility has been built into this new transfer machining line.

Automation devices feed different parts at random from two parallel milling machines to an automatic drilling unit.

No idle stations are needed to process different parts.

▪ A new segmented transfer machine line for the first time machines automotive engine intake manifolds complete from rough casting to finished part.

Either two- or four-barrel carburetor manifolds can be fed into the line at random. Built-in sensing devices, automatically shift heads at three stations to provide the required machining operations. No idle stations are necessary to permit processing of the two different parts.

Solve Space Problem—The new line, designed and built by Snyder Tool and Engineering Co., Detroit, is actually three individual transfer machines. End to end they would run to a length of 230 ft. But to fit in a required 175-ft long factory space, Snyder engineers: (1) devised a method of operating two 29-station, 72-ft long transfer milling machines, in parallel; and (2) fed their output through automation devices to a third 32-station, 86-ft long transfer drilling machine.

The huge processing line removes about 18-lb of metal from each 70-lb intake manifold and makes 2450 lb of chips per hour. More than 5400-lb of parts are in continuous process in the machining line. Output is at a net rate of 136 parts per hour.

The first two transfer machines in the line, which perform essentially milling operations, are duplicates of each other. Rough castings are fed to each of the machines into a loading station. Then they are transferred to the second station where they are automatically equalized and clamped to balance the stock removal in the successive machining operations.

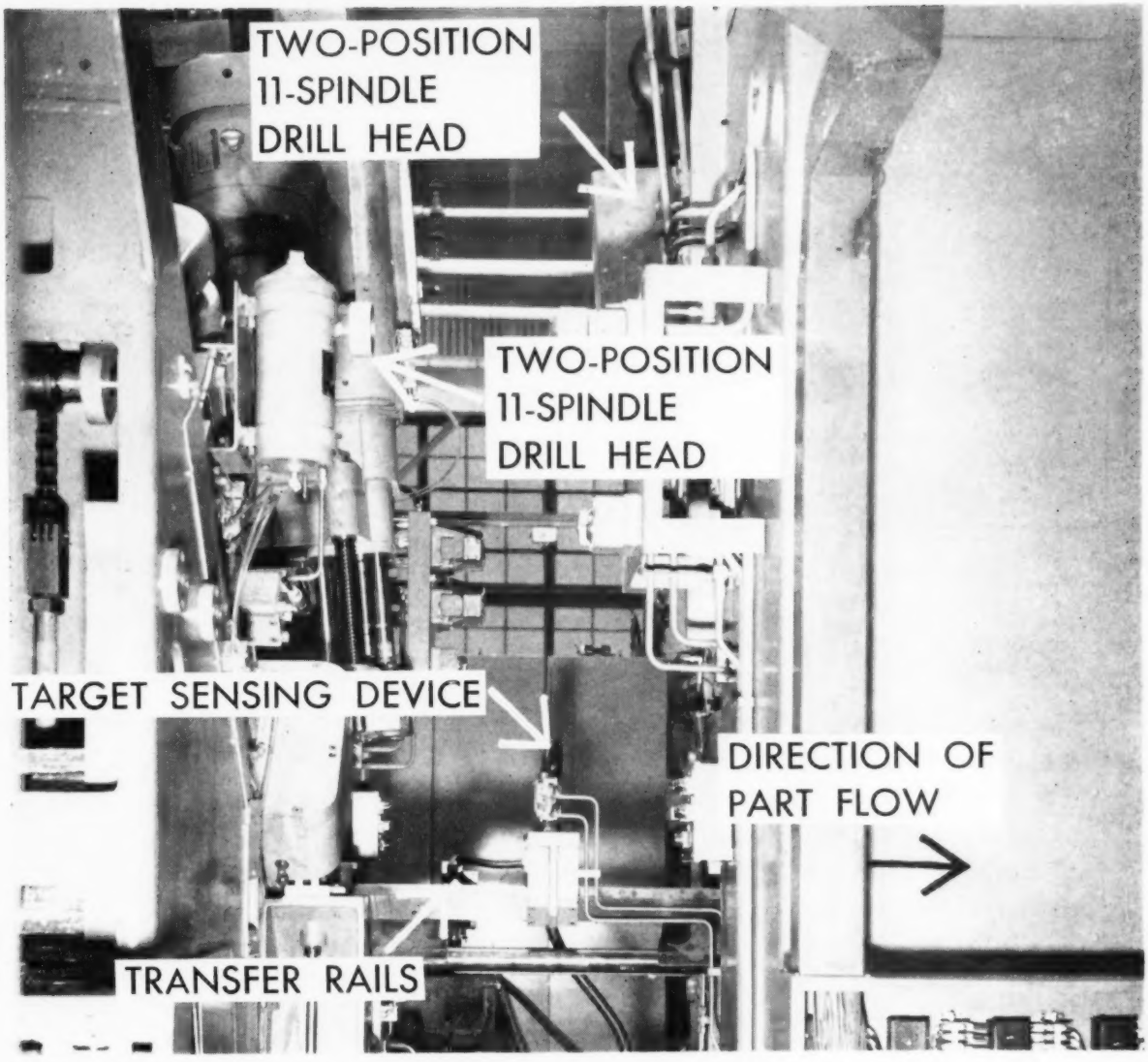
Relieve Stresses — When the cover face has been rough milled in the equalizing clamping fixture, the manifold is automatically turned over and transferred from station to station on this machined surface. By transferring the parts between stations in an unclamped condition, machining stresses due to heavy stock removal are relieved.

With the cover face down, the manifold end pads are milled and the joint face rough milled. The manifold joint face, which has two milled surfaces that must be in accurate relationship, is then finish-milled with a double-spindle milling unit that straddles the transfer line. This unit is fed in the direction of the transfer line on slides mounted on each side of the machine.

Feed On Demand—Following a series of drilling and tapping operations, the manifolds are again turned over and the cover face is finish-milled. The carburetor pads are then rough and finish-milled.

After drilling the mounting holes for the carburetor and the milling of a push rod clearance, the drilled holes are automatically probed with in-process gaging devices that shut down the machine if any holes are incomplete.

Automation devices feed manifolds alternately from the parallel milling machines based on the demand of the drilling machines. An automatic part positioning device operated by the transfer mechanism of the drilling machine automatically turns the manifolds 90-deg as they enter the transfer machine. Following a series of drilling, prob-



PART FEEDING: Two-position drill heads and target sensing devices enable the machine to process either two-barrel or four-barrel manifolds at random. Sensing units shift the machining heads as required

ing, reaming and tapping operations, the manifolds are again automatically turned 90 deg.

Heads Shift Automatically—Another series of drilling, probing, reaming and tapping operations are performed to complete the machining of the manifolds in the third transfer machine. At one of the tapping stations in this machine, drilling and tapping heads are automatically shifted according to the two- or four-barrel carburetor mounting surface hole requirements.

Standard machining units with hardened and ground ways are used throughout the transfer machines. Each of the milling transfer machines has six standard way-type machining units powered by standard external hydraulic power units, and eight standard self-contained machining units. The drilling machine has eighteen standard self-contained units and eleven way-type machining units.

Operate Independently—All tapping spindles in the three transfer machines have individual lead-screw drives. Automatic lubricating systems are provided throughout. The entire transfer line is made up of a series of individual segmented machines, each segment having its own control panel and capable of individual operation. Walking-beam type transfer mechanisms move the manifolds through the three machines. The entire machining line is hydraulically-operated and electrically-controlled with JIC standard components.

Thus, all elements have been designed to insure an uninterrupted flow of both manifold types.

STRAPPING STACK: VIP's of Sharon Steel look on as A. M. Tredwell, VP, shows how easily it's done.

Mobile Strapper Speeds Coil and Sheet Handling

Steel strappers wrap bundles in a hurry. They'll quickly tie small cartons of parts or stacks of sheet with equal efficiency.

There are two principal ways to strap; take the unit to the work and vice versa.

Until recently, heavy jobs did the moving. Now a portable unit goes to the work.

▪ Light-gage steel strapping is popular for several reasons. It's fast, efficient and easy to use. All a strapper operator has to do to bind an item is place metal bands around it and tighten the bands with a small, portable tool. The strapper's mobility is important. Its light weight lets the worker take it to a pack that might be five times the tool's weight. Until now, these advantages didn't quite apply to heavy-duty strapping operations. Now, they do.

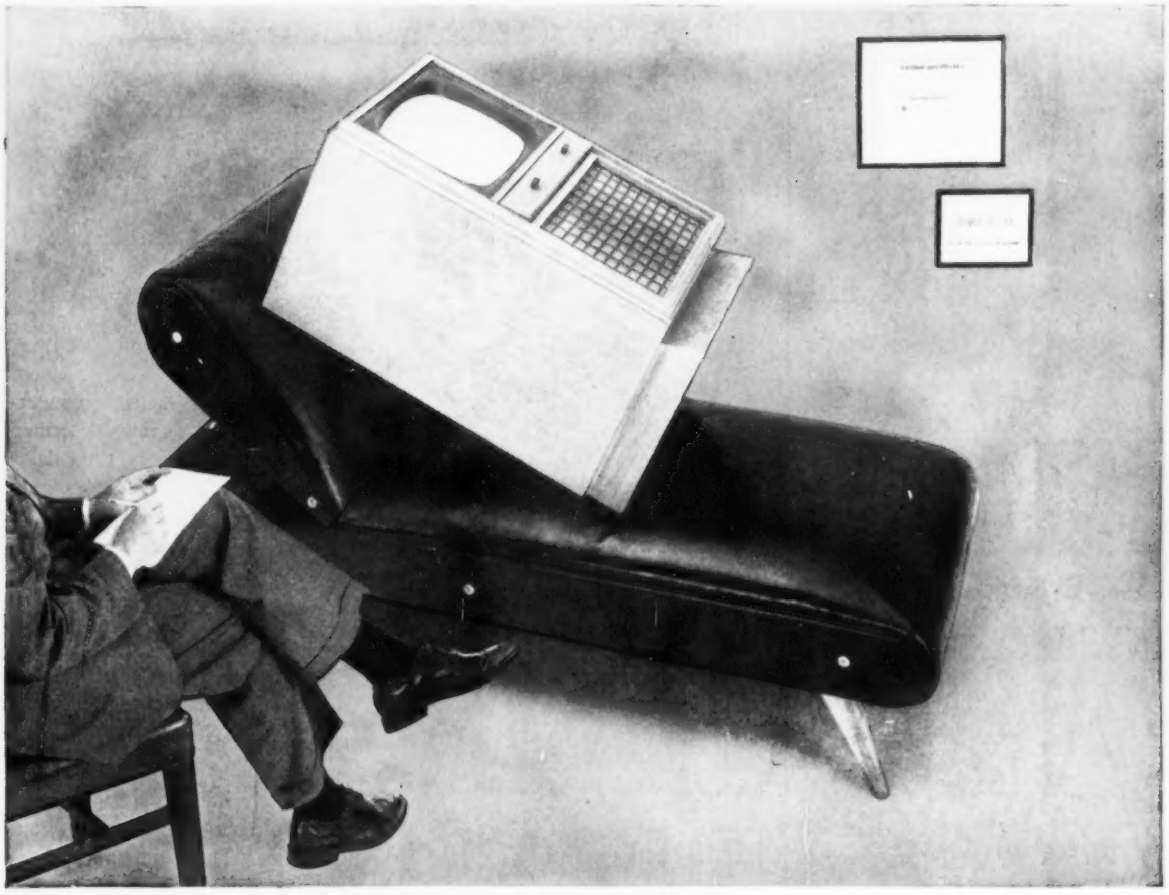
Thanks to a new lightweight pneumatic strapper, workers at Sharon Steel Corp. can now carry the unit right to large jobs, just as others do on smaller work. This makes materials handling easier. It does away with moving bulky, untied stock to stationary or semi-portable machines. Using the 12-lb unit, employees can now rapidly tie large coils or stacks of sheets with heavy-duty steel bands.

Tackles Many Jobs—Sheet and metal stock binding isn't the device's only job. It also ties pallets and skids, braces cars and large cartons and bundles.

The strapper's main asset is it's combination of the portability of light-duty models with the ruggedness and high band tensile uniformity usually associated with much heavier tools. The latter is due to the fact that it's air-powered.

Less Tiring To Use—Reduced operator fatigue is another feature of the unit. Its 12-pound weight makes it fairly easy to move from job to job, or one work area to another. Moreover, the equipment isn't bulky and it's simple to operate.

The operator merely cuts a piece of strapping to size and places it around the item to be bound, leaving a 12-in. lapover. He threads both ends of the strap through a small metal seal, allowing 8-in. to protrude. Following this, he grips the strap with the tool. Closing a small throttle provides air pressure which tightens the strap. Then he cuts off the excess strapping by pushing a handle on the unit. That's it; the item is strapped. The operator, of course, repeats this procedure until the necessary number of straps has been applied to tie the item securely.



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New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 117.

Blast Cleaners

Airless abrasive blast cleaning machines are presented in four bulletins. Each covers a different model. (Wheelabrator Corp.)

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Die Steel

Three grades of hot work die steel are described in a technical bulletin. It lists elevated temperature physical properties. (Firth Sterling, Inc.)

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Switch

A data sheet covers a new flexible actuator switch. (Micro Switch Div., Mineapolis-Honeywell Regulator Co.)

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Welding Equipment

Fillerarc automatic welding setups are reviewed in a bulletin. This equipment employs the consumable-electrode, gas shielded process. (General Electric Co.)

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Timing Motors

A combination catalog-manual just issued is easy to use and keep up-to-date. It contains an initial issue of 25 color-coded engineering bulletins. Among units described are: repeat cycle timers, time delay relays, elapsed time indicators, stop clocks, ac, dc and chronometrically governed timing motors, and relays. (The A. W. Haydon Co.)

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Investment Casting

Why should you be interested in vacuum melting? What has been done and what is coming for investment casting of vacuum alloys? What equipment does vacuum melting require? These are some of the questions that find answers in a booklet. (Cannon-Muskegon Corp.)

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Router Bits

Router bits for nonferrous metals and other materials are described in a 4-page bulletin. These tools are made of an abrasion-resistant chrome cobalt steel. (Detroit Tap & Tool Co.)

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Broaching Machine

Horizontal broaching machines for production gun rifling are detailed in a 4-page folder. (Colonial Broach & Machine Co.)

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Powder Metals

Powder metallurgy is discussed in a pair of publications. These deal with a process for fabricating powdered metal parts. The first covers self-lubricating oil impregnated

bronze and iron bearings of standard sizes. The second is a brief synopsis of the evolution of powdered metal. (Asco Sintering Corp.)

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Centrifugal Castings

How centrifugal castings solve cylindrical problems is explained in a folder. It tells why advanced centrifugal casting techniques offer possibilities of making many cylindrical parts that can't be made at all, and some that can't be made as well, by any other method. (Sandusky Foundry & Machine Co.)

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Nothing

Nothing, alias high vacuum, is discussed in a 24-page booklet. It reviews high-vacuum equipment for many laboratory and plant operations. (Rochester Div., Consolidated Electrodynamics Corp.)

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Die Castings

You can step up production and cut costs by using diecastings. So states a folder. It gives a capsule review of all aspects of diecasting and offers the services of one firm that's ready to make them for you. (The Hoover Co.)

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Chucking Reamers

Standard chucking reamers stocked by one supplier are listed on a handy wall chart. (The DoAll Co.)

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Transformers

Distribution transformers for industrial substations are described in a 16-page bulletin. (Allis-Chalmers Mfg. Co.)

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Honing tools designed for individual job requirements produce

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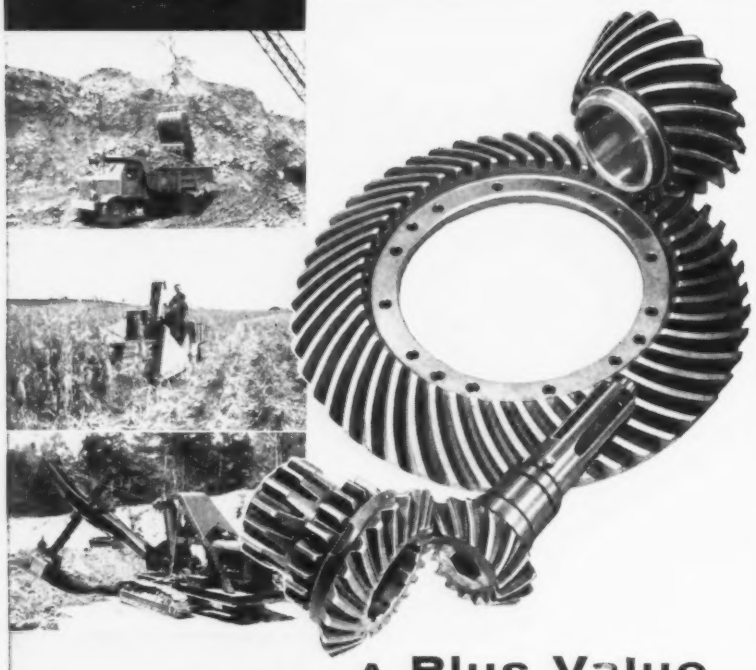

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greater honing efficiency. So states a firm's bulletin. The brochure also offers data on a line of honing tools. (Barnes Drill Co.)

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Tubular Parts

Fabricated tubular parts are listed in a catalog. The 24-page publication also describes and illustrates some fundamental operations used in tube fabrication. (Wolverine Tube Div., Calumet & Hecla).

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Chain Hoist

Electric chain hoists are the subjects of a bulletin. It describes a single chain 300-2000-lb capacity model and a double chain 3000-4000-lb capacity model. (Wright Hoist Div., American Chain & Cable Co., Inc.)

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Corrosion Inhibitor

A 6-page folder describes a corrosion inhibitor for closed circulating water systems. It works with or without anti-freeze. (Hagan Chemicals & Controls, Inc.)

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Fasteners

Flat nut fasteners for use in high-speed assembly operations are detailed in new literature. Data on length, width, material thickness, screw size, and other information of importance is included in easy-to-read form. (The Prestole Corp.)

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Gages

Gage products available from one maker are listed in a 40-page catalog. It contains specifications, prices and sizes of: thread plug gages, thread ring gages and special gages. (Cadillac Gage Co.)

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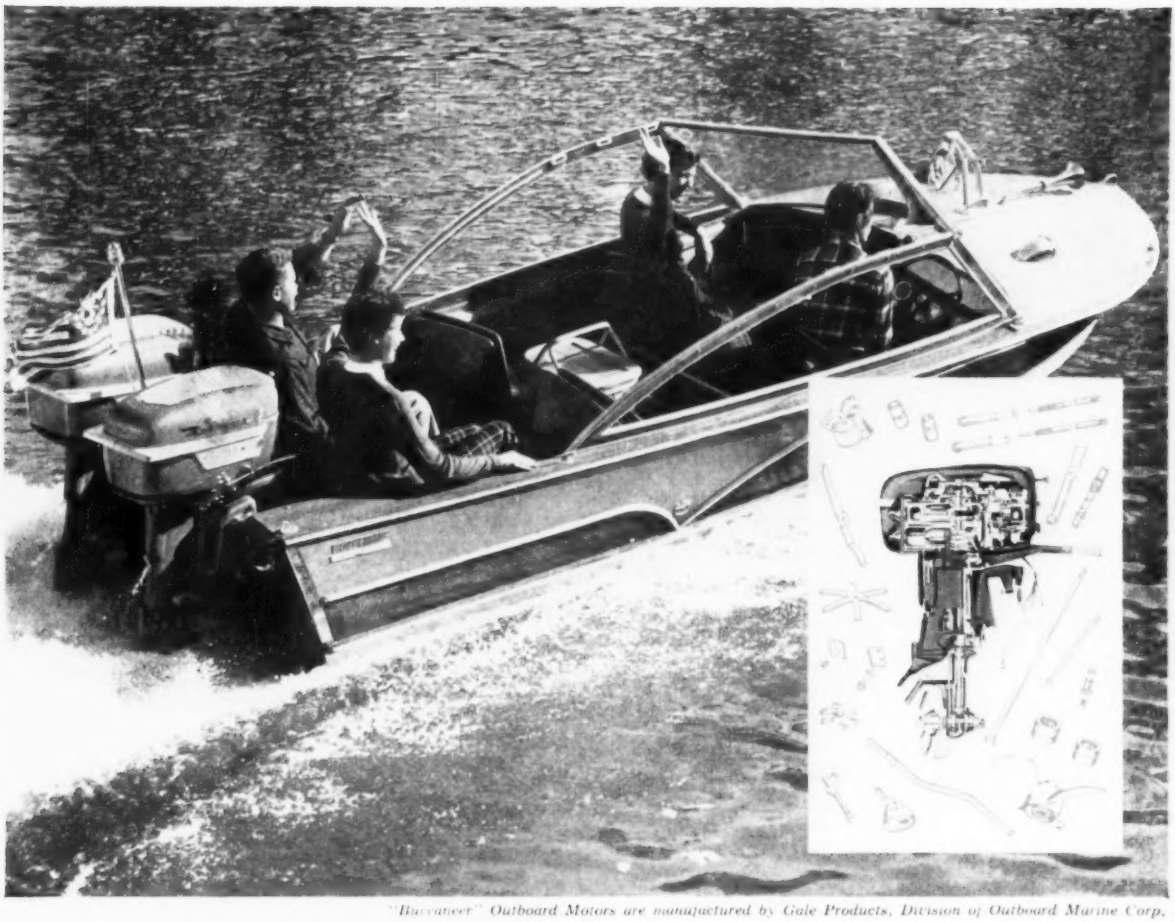

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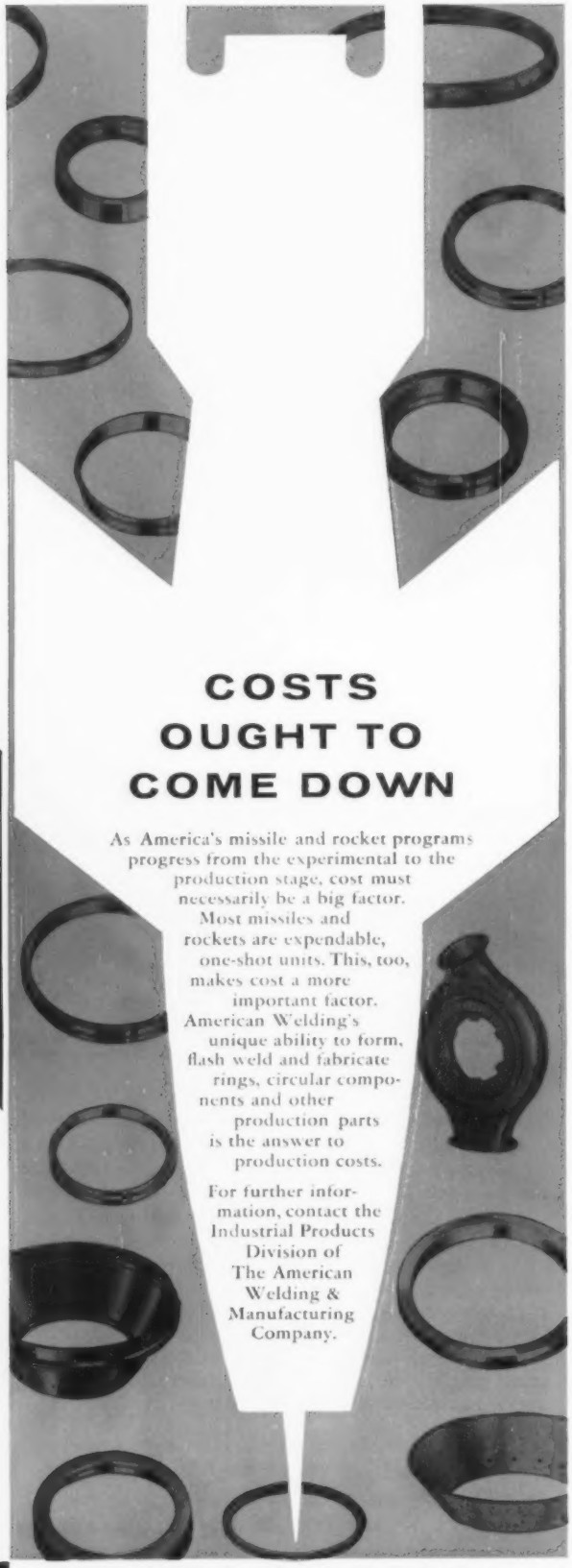

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These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Iron Powders

A new booklet lists complete characteristics and properties of iron powders. The publication contains easily-read curves on various types of powder covering briquetting, green strength, iron sinter, iron-copper mix, iron-copper bushings and iron-copper-carbon mixes. Complete material specifications appear and valuable design pointers are given. Also outlined is an exclusive development in the metal powder industry called Controlled Dimensional Factor. This permits control of growth characteristics in the presence of copper. (Iron Powder Div., Republic Steel Corp.)

For free copy circle No. 21 on postcard

Valves

Looking for a brass valve for steam, water, oil, air, gas or gasoline service? Well, a 4-page folder on brass composition-disc globe, angle and lift check valves may help you find one. (Crane Co.)

For free copy circle No. 22 on postcard

Screw Pumps

Basic construction and design features of standard screw pumps are shown in a bulletin. It includes double external bearing and gear type, and double external bearing and hopper type pumps. (Warren Pumps, Inc.)

For free copy circle No. 23 on postcard

Wheel Dressing

How cutters of cemented diamond particles keep grinding wheels in good shape is told in a brochure. The publication is the first of a series of progress reports on permanent form control of wheels. It explains a process which permits complete automation of grinders with no time-out for dressing. This is a co-development of Jones & Lamson Machine Co. (Koebel Diamond Tool Co.)

For free copy circle No. 24 on postcard

Pneumatic Units

Pneumatic Specialties are covered in a 4-page bulletin. It lists filters, regulators and lubricators. (Watts Regulator Co.)

For free copy circle No. 25 on postcard

Instrument Parts

Facilities for prototype and production work on instrument components and assemblies are described in a 4-page bulletin. (Arrow Tool Co.)

For free copy circle No. 26 on postcard

Hose Lines

Two catalog sections describe water suction and steam hose. (B. F. Goodrich Industrial Products Co.)

For free copy circle No. 27 on postcard

Pillow Blocks

A 10-page catalog illustrates a new idea in pillow blocks. Equipped with lubricated-for-life ball bearings, these pillow blocks come in wide range of bore sizes, from ½ through 2-15/16 in. (New Departure Div., General Motors Corp.)

For free copy circle No. 28 on postcard

Bushings, Sleeves

Bushings and sleeves for handling hot, abrasive materials are covered in an 8-page brochure. These are low friction, non-seizing, corrosion resistant products. (Haynes Stellite Co.)

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Sheet Separators

Sheet steel separators are covered in a catalog. These separators are permanent magnet units which in-

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

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No postage necessary if mailed in the United States

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THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

duce a magnetic field in stacked steel sheets and laminations. They reduce operating costs, the catalog states, because they speed up sheet feeding by separating one from another. (E. V. Nielsen, Inc.)

For free copy circle No. 30 on postcard

Precision Strip

Strip rolled to exacting standards is covered in a dozen-page booklet. It offers a brief synopsis of how this precision strip is rolled, and lists materials available in strip form. These include: beryllium copper, chromium copper, phosphor bronze, nickel silver, brass, copper, stainless steels and nickel-iron. (Penn-Precision Products, Inc.)

For free copy circle No. 31 on postcard

Coagulant Aids

Coagulant aids for use in industrial water clarification and waste water treatment systems are reviewed in a booklet. It points out that these aids speed up floc formation and also tend to produce larger, heavier, tougher flocs over wider pH ranges than coagulants alone. (Hagan Chemicals & Controls, Inc.)

For free copy circle No. 32 on postcard

Insulating Motors

The value of rewinding motors with silicone insulation is appraised in dollars-and-cents terms in a brochure. (Dow Corning Corp.)

For free copy circle No. 33 on postcard

Conveyor Track

Application ideas and features of a conveyor track are reviewed in a bulletin. This track is a gravity conveyor in its basic form. (The Rapids-Standard Co., Inc.)

For free copy circle No. 34 on postcard

Conveyors

Both power and free conveyor systems are discussed in a pamphlet. The 16-page publication describes and pictures 10 major materials handling functions that invite use of powered and free conveyors. (Jervis B. Webb Co.)

For free copy circle No. 35 on postcard

Heating Problems

Solutions to four heating problems appear in a pamphlet. These difficulties, due to odd contour shapes, space and/or weight limitations, are eliminated by a sprayed-on film-type heating element. (Electrofilm, Inc.)

For free copy circle No. 36 on postcard

Welding Automation

Automated welding units are described in a 4-page brochure. (Airline Welding & Engineering.)

For free copy circle No. 37 on postcard

Punch Press

A data sheet covers a 5-ton punch press. This press, it says, is built to big press standards for fast, accurate punching at lost cost. (Kenco Mfg. Co.)

For free copy circle No. 38 on postcard

Electrodes

An 8-page bulletin offers data on pH electrodes for laboratory and portable pH meters. (Beckman Instruments, Inc.)

For free copy circle No. 39 on postcard

Thermoplastic

Chemical resistant sheet is covered in an 18-page booklet. This material is a thermoplastic for lining storage tanks, processing tanks, pipes, fittings, ducts and hoods. (The Dow Chemical Co.)

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Rubber Runners

Literature describes a firm's honeycomb runners for "stand-up" workers. These runners interlock to any length. They insulate against cold, dampness, etc. (R. L. Mitchell Rubber Products, Inc.)

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THE IRON AGE
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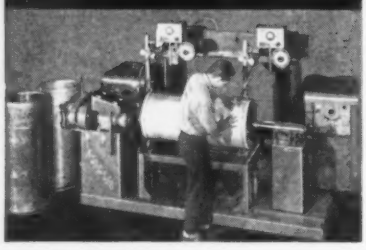
Ready, Set, GROW... with

REVERE ALUMINUM TUBE

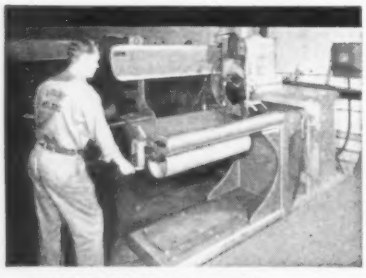
For aluminum tube that is right for its purpose and comes to you right on schedule, call the nearest Revere Sales Office. Revere is headquarters for tube . . . seamless drawn, welded, lockseam and other types, in an extensive range of sizes, alloys and tempers, both round and other than round. It will pay you to tie the growth of your business to the most dependable sources of supply. Revere Copper and Brass Incorporated. Founded by Paul Revere in 1801. Executive Offices: 230 Park Avenue, New York 17, N. Y.

Revere Aluminum Mill Products include coiled and flat sheet, both plain and embossed, circles and blanks, Tube-In-Strip,* extruded products, all types of tube, rolled shapes, electrical conductors, forgings, foil, and frozen food containers. *Revere's trademark for sheet metal containing inflatable channels.

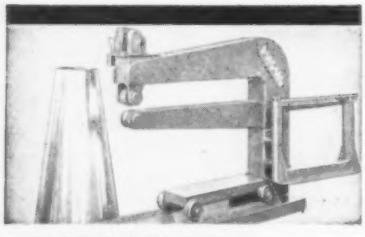
how to make fusion butt welding a ***push-button operation***



CIRCUMFERENTIAL
automatic welding fixture
Designed for circular welding of components with automatic chucking and ejection of parts and transfer. Chuck expands internally for sizing. Surface speed to 300" per min.



LONGITUDINAL *automatic fusion butt welding fixture*
Hold-down fingers with "toe touch" control lock parts in position for welding. Back-up mandrell with up to 6 copper inserts permits fast job changes. Handles all weldable metals .005 to 1" thick and lengths from 2' to 12'.



ROLL PLANISHING FIXTURE
Cold-rolls and smoothes fusion welds (circ. & longit.) under controlled pressure up to 10 tons. Handles $1\frac{3}{4}$" to 10' dia. and lengths to 16'.

Write today for further information
785 No. Prairie Ave., Hawthorne 2, Calif.

Airline WELDING
WELDING & ENGINEERING
FIXTURES & POSITIONERS
"guides the arc to the mark"

You Arbitrate It!

THE SATURDAY DRIVER

From the files of the American Arbitration Association

For a long time, one of the most persistent disputes between the steelworkers union and an engineering company involved supervisors and other employees outside the bargaining unit who worked at jobs covered by the collective bargaining agreement. Management never intended supervisors to do so much production work as to seriously interfere with earning opportunities of the union members. But the union didn't take any chances. It demanded an absolute ban on any work that was normally within the job classifications covered by the contract.

In the latest contract, a compromise formula was agreed to. It read: "Supervisors, or other employees not covered by this agreement, shall not be permitted to perform work consistently performed by the production and maintenance employees covered by this agreement."

Complication Sets In—It wasn't long before a dispute arose over application of this paragraph. A draftsman, outside the bargaining unit, occasionally was asked to drive a panel truck to a customer's foundry to deliver sample patterns and discuss specifications. He sometimes drove on Saturday, when a regular driver was not available. However, he also drove during the week.

The union objected. "It's okay for the man to drive a truck on Saturdays, when the regular driver may not be on hand, or in a real emergency," the shop steward conceded. "But he has no business doing it during the week when a union driver is available."

Management's defense was threefold: the draftsman never made more than four such trips a week; a regular driver wouldn't know what to discuss with the customer, which meant the draftsman would have to go along anyway; and the union driver had plenty of other work to do and never lost any time.

Eventually, the case went to arbitration. How would you rule?

(For Answer See Opposite Page)

NEW FILMS

"Two Heads Are Better Than One" shows multiple-head, conveyor-type abrasive belt grinders at work. It pictures units with from two to six grinding heads and conveyorized through-feed. 18 min. 16 mm color, with narration. Engelberg Huller Co., 831 West Fayette St., Syracuse 4, N. Y.

"Electronic Computers Improve Management Control" shows a predicament in a typical manufacturing organization: paperwork delays with resulting lack of management control. It shows how electronic data processing solves the problem. 15 min., 16 mm color sound. Educational Film Sales Dept., University Extension, University of California, Los Angeles 24.

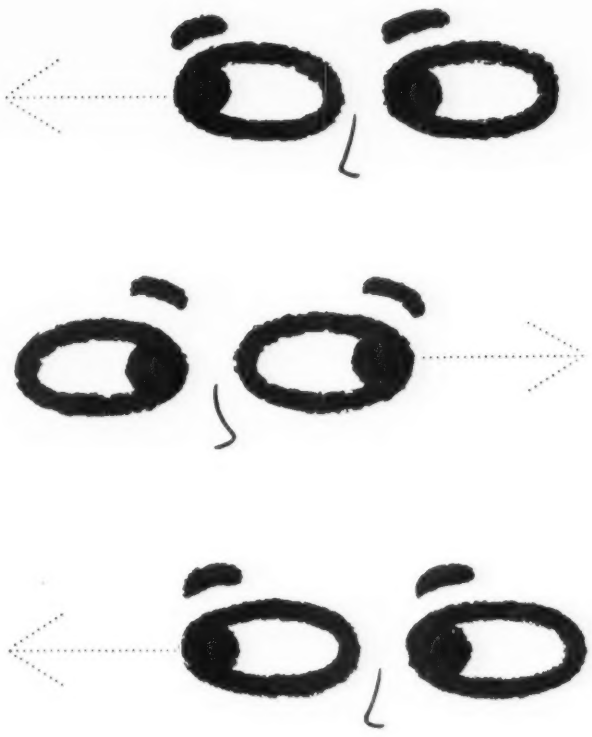
"The Margin of Safety" depicts the logic and necessity of industrial plant safety and the need for wearing safety shoes. 20-min. sound, black and white. International Shoe Co., St. Louis 3, Mo.

"Speeding the Distribution of Engineering Drawings by Xerography," features a new drafting idea. It pictures a unit that reduces big drawings to 12 x 18-in. masters. These are then turned into mass produced copies. 15-min. 16 mm sound. Film Distribution Dept., The Haloid Co., Rochester 3, N.Y.

The Arbitrator Ruled:

"It is my interpretation of the contract that it is not the intent of the parties that the draftsman shall routinely take patterns to the foundry or to customers. He may drive a truck when other truck drivers are unavailable, but he may not perform unit duties either on a regularly scheduled basis, whether during the week or on Saturday, or regularly make pickups and deliveries to specific suppliers or customers."

Caution: The award in this case is not an indication of how other arbitrators might rule in other apparently similar cases. Arbitrators do not follow precedents. Each case is decided on the basis of the particular history, contract, testimony and other facts involved.



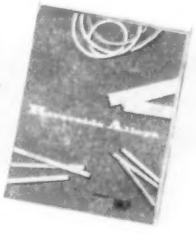
Alternating stresses bear watching!

Back and forth . . . up and down . . . in and out . . . if those stresses keep changing, the life of a metal part is a hard one . . . and often a short one. Stress reversals can cause "fatigue" failure at stresses far below the expected strength of the metal.

One of the outstanding properties of phosphor bronze is its high resistance to fatigue failure. It is widely used for electrical switch parts, relay contact springs, bellows, rotating shafts and other moving or vibrating parts.

For detailed information on phosphor bronze, write to Riverside-Alloy Metal Division, H. K. Porter Company, Inc., Riverside, N. J.

Send today for our free handbook



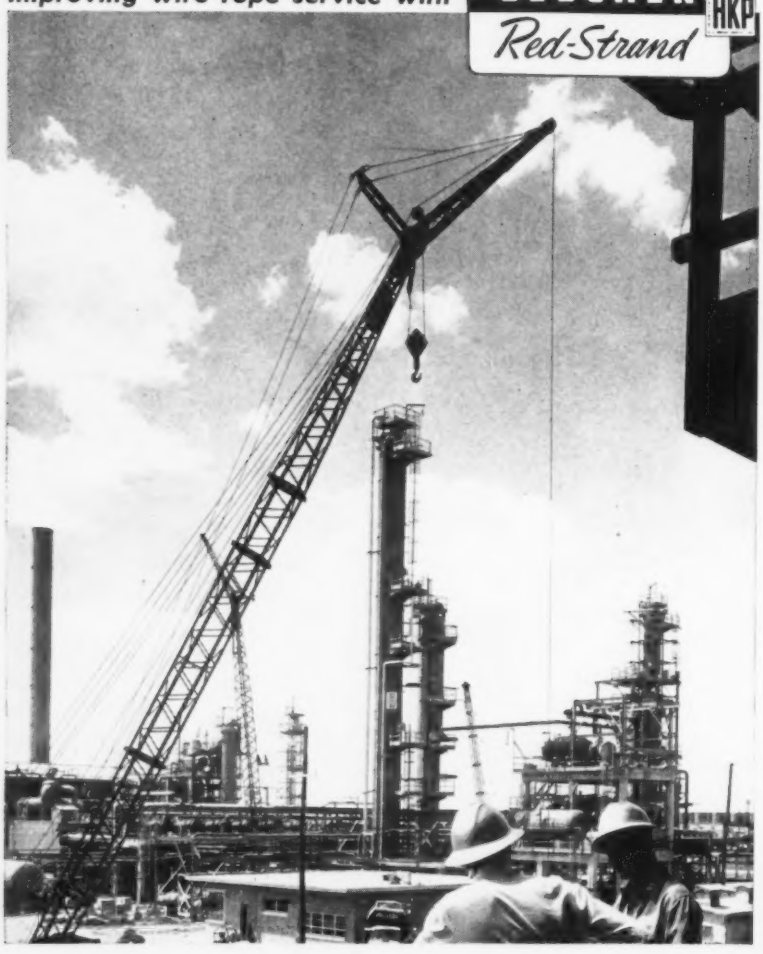
ALLOY METAL WIRE
Prospect Park, Pa.

RIVERSIDE METAL
Riverside, N.J.

PRENTISS WIRE MILLS
Holyoke, Mass.

HKP RIVERSIDE-ALLOY METAL DIVISION
H. K. PORTER COMPANY, INC.

Improving wire rope service with **LESCHEN** HKP *Red-Strand*



This *one* test proves which wire rope serves you best

"Problem jobs" may frequently make you wonder about the rope you're using.

Are you faced with unusual operating conditions? Is the rope the right type—size—grade—construction? Is greater tensile strength needed? Are you using the right brand?

The test is to use Leschen's on-the-job Service-Score Sticker reports. Keep the score—know the results—and questions are answered.

Then check with your Leschen man for engineering help. And, be sure to use Leschen's highest quality, service-proved Red-Strand wire rope. *Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Mo.*

Write for Service-Score Fact-Folder

HKP LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.

TECHNICAL BRIEFS

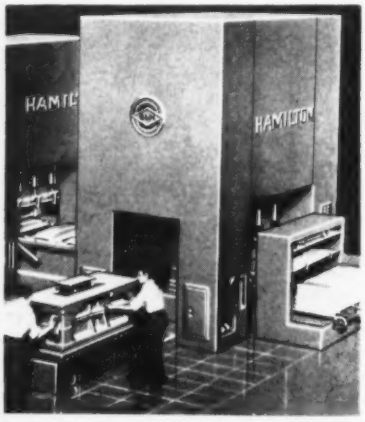
Press Design Speeds Die Changing

Between operations, die changes tie up presses for hours. On short runs, this really hurts. Now along comes a setup that gets the job done in minutes.

■ If die changing on short press runs takes longer than you think it should, take a look at this. It's a press design that drastically cuts time needed to switch dies.

Using sliding bolsters and preset dies, the new setup can apply to a single press or in groups. It fits in with practically any size or type press—single or double action; top or bottom drive; one, two or four point models.

Zip, Zip; In, Out—Developed by the Hamilton Div. of Baldwin-Lima-Hamilton Corp., Hamilton, Ohio, the setup has been in use on the



Here, two workers slide a new die bolster into a press.

firm's spotting presses for some time. However, the sliding bolster is a new idea for presses performing production blanking, drawing and forming.

When a press run is over, workers remove the die on the sliding bolster. A new die, set up on a second bolster during operation with the previous die, slides into the press for a new production run.

The key advantage of the press design is speed. As die change time goes down, production goes up. As little as five minutes need elapse between the end of one production run and the start of another using a new die.

Takes Minutes In Open—Time needed to remove a die in the open takes just minutes. Compared to two hours change for some conventional presses, normal time required to change dies on the outboard bolster is a half-hour. That's a 75-pct reduction—and it's done while the press is working, too.

Casts Big Irregular Stainless Screw

Casting a large, irregular stainless steel screw has its advantages. So finds a manufacturer that once machined the intricate piece from bar stock.

Measuring 60-in. long with 6-in. diam flights, the screw has a shaft that tapers from 3 to 2⅛ in. over the full length. It's cast of ACI Type CF 8 stainless. Empire Steel Castings, Inc., turns out the casting for a food processing equipment maker.

Cuts Costs—Originally, the piece was fabricated from straight carbon steel bar stock. Cost of fully machining it came to about $1500 in material and labor. And the process took 100 hours of labor. This method was found so inefficient that it seriously upset the production timetable of the equipment manufacturer, Clermont Machine Co., Brooklyn, N. Y.

Not only this. Making the screw from carbon steel instead of stainless—which cost too much to mill

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 117. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Proof of Vulcan Tool Steel Superiority:

Tooling Downtime Reduced
PRODUCTION UP 15%!

Vulcan TM-6, "M-2 type" high-speed tool steel, has increased tap life by 15% at Detroit Brass & Malleable Company, Wyandotte, Michigan.

Eight years of closely-controlled "stand up" tests of milling cutters and thread hobs preceded the selection of TM-6 for exclusive use in threading and tapping machine operations. *The payoff:* Production records, for the past seven years, offer positive proof of 15% better performance by using Vulcan TM-6.

Comparable on-the-job performance information is available for many of Vulcan's other steel grades. For the name of your nearest Vulcan representative write, wire or call collect. Vulcan Crucible Steel Division, H. K. Porter Company, Inc., Aliquippa, Pa.

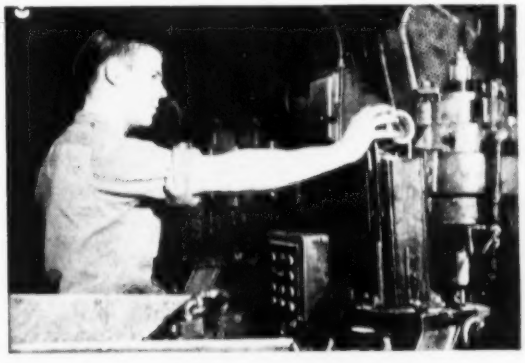
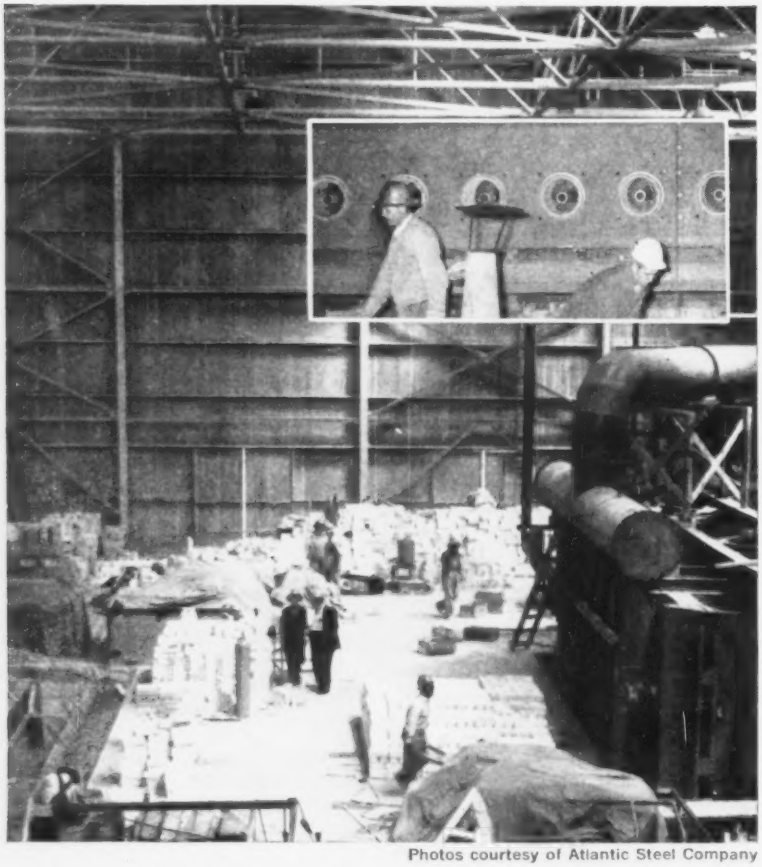


Photo at top shows General Foreman Robert Welch giving "specification plus" okay to DBM fittings as Vulcan representative examines tap used in manufacture.

Photo at left shows typical tapping machine operation at Detroit Brass & Malleable Company's nine-acre site.

HKP VULCAN CRUCIBLE STEEL DIVISION
H. K. PORTER COMPANY, INC.

Profitable Trends in the use of Refractories



Photos courtesy of Atlantic Steel Company

New furnaces start right with Laclede-Christy Refractories

Specifications on Atlantic Steel Company's new 13″ Bar and Rod Mill included a 90 ton per hour reheating furnace. They called on a leader in the field, Rust Furnace Company, to build it. Rust's experience and knowledge prompted their use of Laclede-Christy refractories.

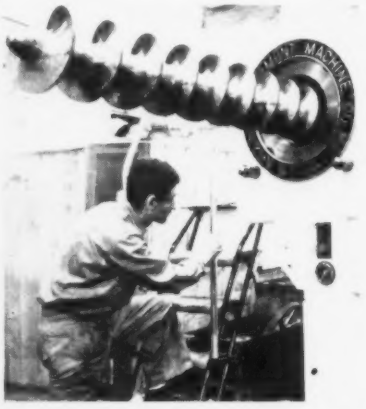
The installation included Spallac super-duty fire brick which has proved its long-lasting qualities in other installations . . . requiring minimum maintenance and reducing downtime. Spallac super-duty features high refractory value, good volume stability, and high resistance to spalling. Also included was Laclede King high duty brick.

To start your furnace right—for new or replacement installations, it pays to use Laclede refractories. Call Laclede-Christy Works, Refractories Division, H. K. Porter Company, Inc., St. Louis 10, Mo.

HKP LACLEDE-CHRISTY WORKS REFRACTORIES DIVISION H. K. PORTER COMPANY, INC.

—resulted in a part that couldn't even withstand corrosive conditions the piece later encountered. The finished screw was subject to excessive pitting, rusting and bacteria formation.

Switches Horses—Recently, the firm modified the screw's design so it could be cast of a stainless alloy. It now turns, finishes and polishes



This unique screw is cast of stainless steel.

the casting in about 42 hours at a total cost of about $750 for material and labor.

Cost cutting isn't the only advantage of the redesign. With a casting, the equipment now requires fewer movable parts, less maintenance. Difficult angles and pitch are achieved that weren't possible before. This gives the screw a better backlash in its mounting.

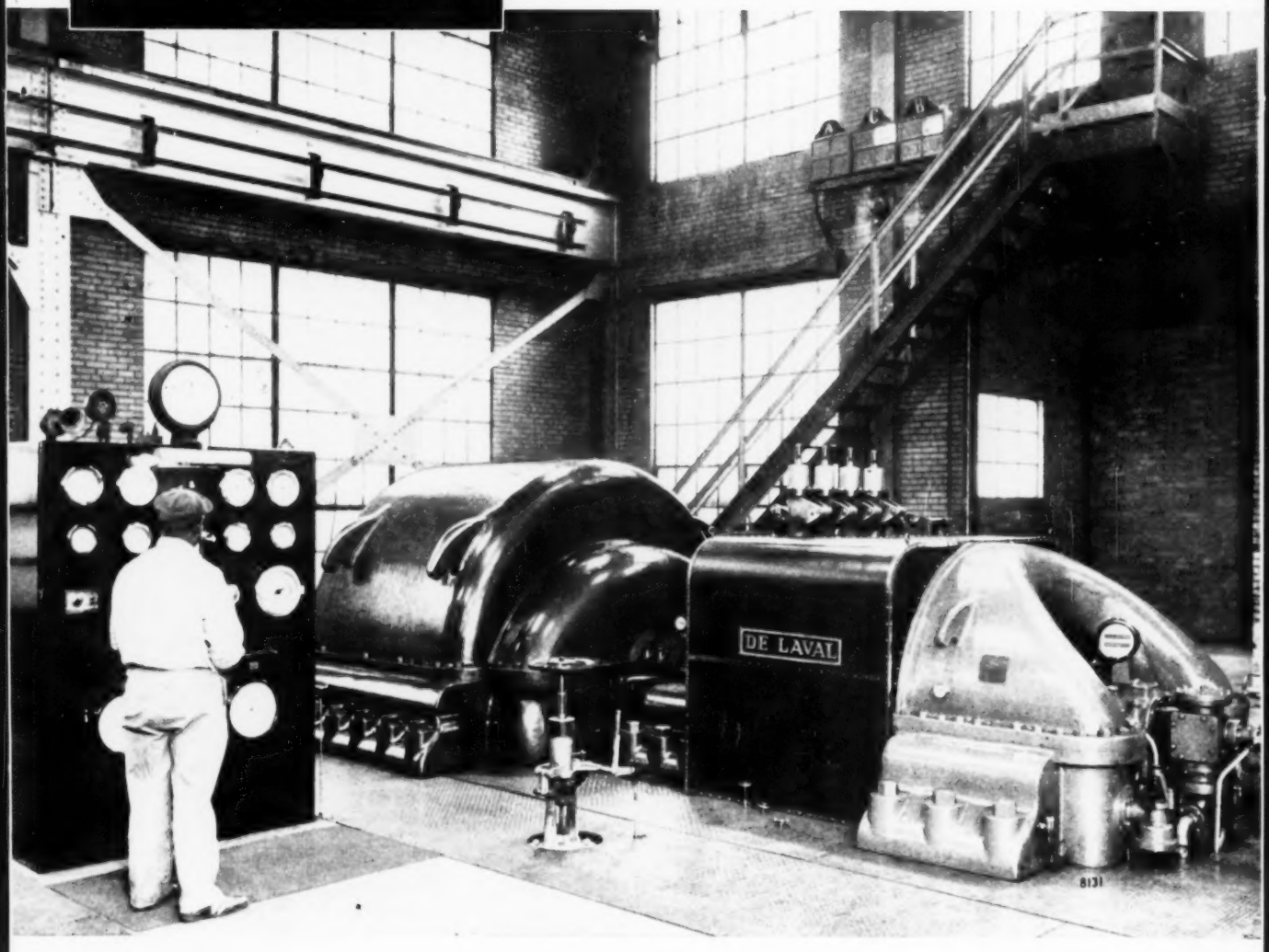
Anneals Continuously

For continuous coil-annealing, a newly installed furnace enables Chicago Screw Co., Bellwood, Ill., to process 50 tons of rod or hot-rolled wire per day. Gas-fired, the radiant tube unit is over 13-ft high x 15-ft wide x 102-ft long. Annealed stock is later headed, machined and threaded into the company's standard fasteners or special products.

The furnace provides for both spheroidizing and other types of

DE LAVAL
BLAST FURNACE BLOWERS

give 20 years of service at Great Lakes Steel Corp.



Shown is one of two De Laval centrifugal blast furnace blowers at the Ecorse, Michigan, plant of the Great Lakes Steel Corporation, Division of National Steel Corporation. This 85,000 cfm unit was installed twenty years ago; another 75,000 cfm unit went on the line a year earlier. Both have given dependable round-the-clock service ever since. These turbine-driven blowers are hooked up to a multi-head which enables either one to be used in conjunction with any of the three blast furnaces.

De Laval centrifugal blowers are built in single and multi-stage types to supply air in volumes up to 150,000 cfm for all classes of service in steel, gas and coke plants. The wealth of application experience acquired by De Laval over the years assures a correct and economical solution to your blower problem.

Send for Bulletin 0504

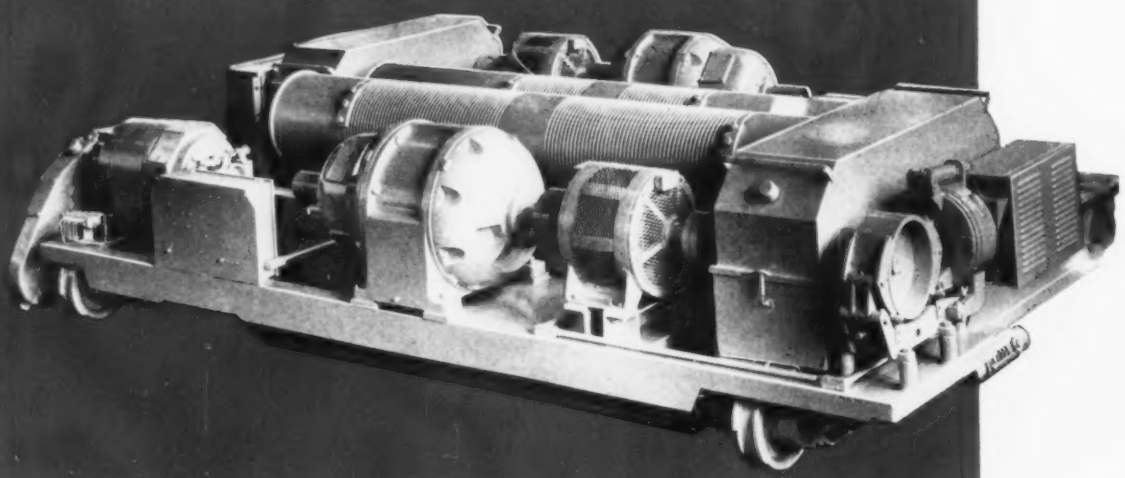
DE LAVAL *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY

899 Nottingham Way, Trenton 2, New Jersey

For Northern Cranes

EZOMATIC
CRANE CONTROL



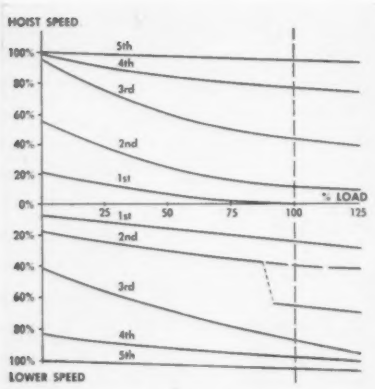
EZOMATIC *is Smooth, Simple, Dependable*

EASIER *to operate*

EASIER *to maintain*

EASIER *to understand*

EASIER *to handle any load*



TYPICAL SPEED CURVES WITH EZOMATIC CONTROL

The new simplified, smooth, accurate control for alternating current hoist motors utilizing full magnetic control combined with an eddy current brake. This improved control arrangement is easier to operate, easier to maintain, makes handling any load easier, safer, more accurate. Regardless of load the speed characteristics both hoisting and lowering are excellent, allowing smooth handling and accurate spotting of any load.

Standard control components familiar to all electrical maintenance and operating men are used throughout. Circuits are simple and readily understandable. No complicated electrical schemes. Used with a standard eddy current brake eliminating mechanical and electrical wear.

Excitation of the eddy current brake is automatically controlled by the motor speed allowing extra smooth acceleration. If fast acceleration is desired it may be obtained by moving the master switch to the last point, thereby eliminating the eddy current brake excitation. Off point braking is provided automatically to assist the motor brake in stopping the load. The motor brake is automatically applied in lowering if the eddy current brake excitation should be interrupted. Speed curves can be readily changed in the field, either up or down by a simple adjustment. When very heavy loads are handled extra lowering speeds are automatically provided.

For further information write to

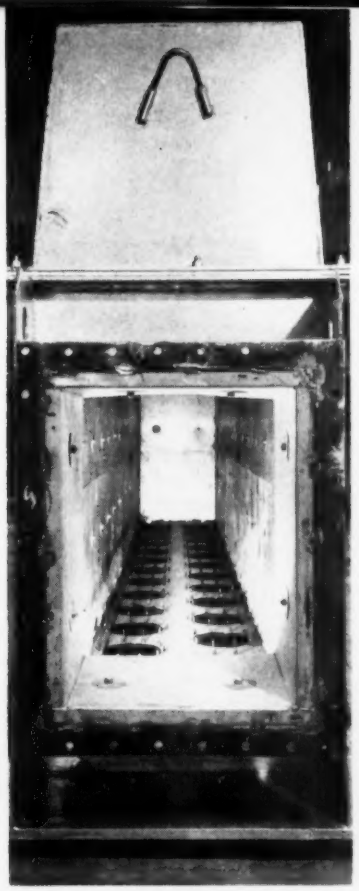
NORTHERN ENGINEERING WORKS

210 CHENE STREET • DETROIT 7, MICHIGAN

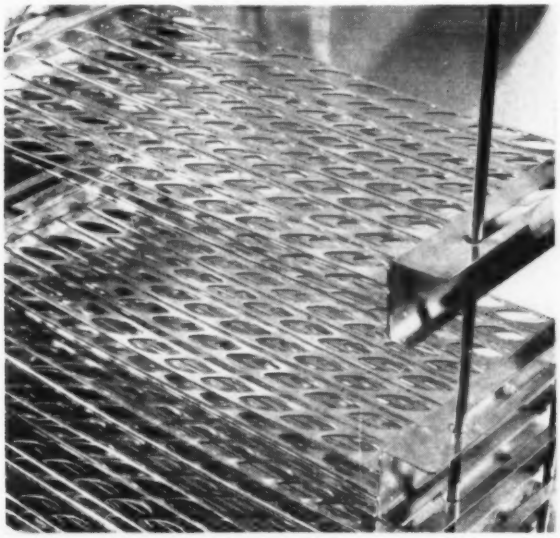
NOTHING can equal Stainless Steel

in its unique combination of properties

No other design material can match Stainless Steel in its combination of desirable properties: corrosion resistance, strength, hardness, beauty, cleanability and easy fabrication. For a reliable source of supply, United States Steel offers you the widest range of types, finishes and sizes. **Just call your steel warehouse.**



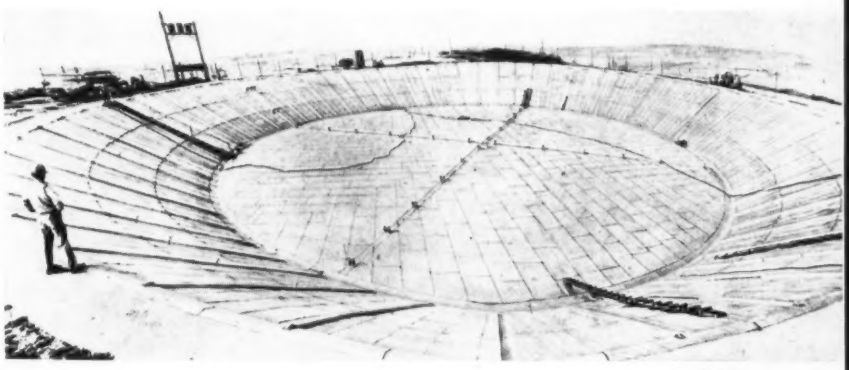
For High Temperatures. This recuperator is used on industrial furnaces. It uses waste flue gas to heat the incoming furnace air and thereby increase the efficiency of the furnace. Formerly, these recuperators were made with ceramic tubes, but heat transfer was low and leakage was high. The Hazen Engineering Company in Pittsburgh makes recuperators almost completely from Stainless Steel. Compared to ceramic designs, the Stainless design saves about 40% in fuel, increases furnace output about 10%-15%. The Stainless Steel performs well, even at this 1800-2300° F. temperature range.



For Cleanliness. When you work near nuclear radiation areas, you wear a small badge containing X-ray film that records how much radiation you have received. The film, "photodosimetric film," is developed in a Sensitometric Processing Unit made by Bar-Ray Products, Inc., in Brooklyn. The unit, including the trays shown here, is made completely from 18-gage Type 316 Stainless Steel because it resists corrosion, is easy to clean, has a hard, dense surface that doesn't harbor dirt.

United States Steel Corporation, Pittsburgh • American Steel & Wire Division, Cleveland
Columbia-Geneva Steel Division, San Francisco • National Tube Division, Pittsburgh
Tennessee Coal & Iron Division, Fairfield, Ala.
United States Steel Supply Division, Warehouse Distributors
United States Steel Export Company, New York

For Corrosion Resistance. The Hercules Powder Company needed an ammonium nitrate storage tank for their plant near Richmond, California. They took an old, World War I concrete reservoir and lined it with Type 304 USS Stainless Steel. The 14-gage sheets are laced with 18,000 feet of vacuum-tested welds. Tank holds two **million** gallons of solution, and is 200 feet in diameter at the top. U. S. Steel's Consolidated Western Division handled the complete installation.

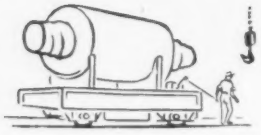


USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS • PIPE • TUBES • WIRE • SPECIAL SECTIONS

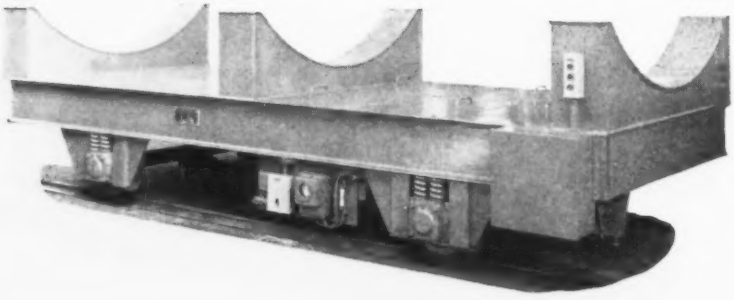
UNITED STATES STEEL

Links up your HANDLING NETWORK



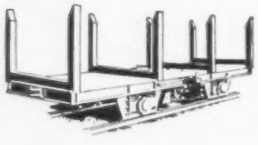
for added efficiency . . .

extra economy



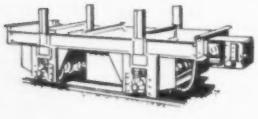
ATLAS WALK-ALONG

SAFETY-TYPE TRANSFERS



Special bed designs to cradle your load.

Single platform or double platform-operator rides.



Versatile power . . . diesel or gas electric, storage battery, or cable reel. Also remote control with no trailing cable.

If you're responsible for maintaining safe, low cost movement of heavy loads, (5 to 200 tons) and intermediate transfer of these loads during process or storage, Atlas can help you by engineering a transfer car to meet your exact load and power requirements.

Atlas engineering gives you every modern safety feature for personnel protection.

. . . choice of power and control including:

1. Single lever (walk-along) forward, reverse with safety stop when lever is released.
2. Storage battery power with built-in charger.

For Cost-Saving Details Request "Walk Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

1140 IVANHOE ROAD • CLEVELAND 10, OHIO

ENGINEERS & MANUFACTURERS SINCE 1896

annealing. Desired structural changes are made as the coils pass through the furnace on trays, each 56-in. square. A series of hydraulic rams push these trays through. Depending on the type of treatment, the annealing cycle ranges from 8 to 20 hours at temperatures from 1250 to 1650°. The furnace is a product of Surface Combustion Corp., Toledo.

Thread Inserts Keep Scrap Heap Small

Gasoline pump components valued from $4 to $90 are salvaged from the scrap heap by a large oil company's repairmen. And the thanks for this saving goes to stainless steel wire thread inserts.

Under the firm's service station maintenance program, the pumps are periodically removed from service for checking and maintenance. The company, Gulf Oil Corp., requires that these get a complete overhaul at a regional repair center.

After prolonged service, a gas pump gets the once-over.

Stripping Teases—A typical repair center tackling typical maintenance headaches is in Atlanta, Ga. Here, repairers frequently find that the cast iron and zinc diecastings forming the pump air eliminator, adaptors and pressure chamber, have damaged threads. Incorrect

BUNKER HILL

The Zinc that originally put Zinc-Base Die-Castings on a High Level . . . and has kept them high!

BUNKER HILL ZINC, when its 99.99+ quality came into the market back in 1928, quickly proved to be a boon to the die-casting industry. It enabled die-casters to take full advantage of the inherent merits of zinc-base castings. Bunker Hill pioneered this basic change in the development of the industry. It is still a leader in the production of quality zinc for die-castings.

Today, the die-caster who wants the best is able to get the purest zinc available—Bunker Hill. If you would be interested in *trying out* Bunker Hill, let us know your requirements. We'll put you in touch with a small tonnage supplier.

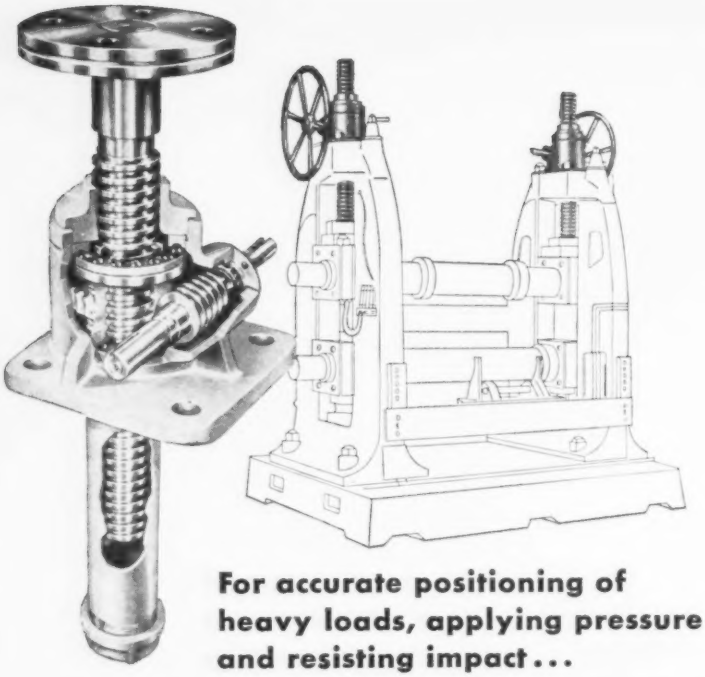
Eastern Sales Agents

ST. JOSEPH LEAD COMPANY • 250 PARK AVENUE, NEW YORK 17, N.Y.

BUNKER HILL 99.99+% ZINC

Sales Office for Pacific Coast

THE BUNKER HILL CO. • 660 MARKET STREET, SAN FRANCISCO 4, CALIF.



For accurate positioning of heavy loads, applying pressure and resisting impact...

Duff-Norton Worm Gear Jacks

Duff-Norton worm gear jacks provide a purely mechanical means for accurately positioning loads weighing up to several hundred tons and maintaining them indefinitely without creep. They may be incorporated into the design of a new piece of equipment, or installed in existing facilities to replace other positioning devices. They will operate in any position, and functioning as components of machinery or equipment, worm gear jacks can raise or lower loads, apply pressure, or resist impact.

Capacities range from five to 50 tons. When two or more are connected by means of shafting and mitre gear boxes to raise loads they lift in unison—even when the load is unevenly distributed. Worm gear jacks are available with standard raises up to 25 inches, and will maintain an exact raise through years of service without adjustment. Each of the six sizes has a standard worm gear ratio ranging between $6\frac{3}{4}$:1 and 32:1. They are made with either square or Acme threads, and give one inch raise for from 10 to 48 turns of the worm. Jacks are suitable for operation at ambient temperatures as high as 200°F.

Thousands of worm gear jacks are in use on feed tables, tube mills, welding positioners, pipe cut-off and threading machines, loading tables, rolling mills, conveyor lines, arbor presses and numerous other types of equipment. To learn how they can improve the performance of your equipment and save you money, write for bulletin AD-34-CC or ask for a Duff-Norton representative to call.

DUFF-NORTON **Duff-Norton Jacks**

DUFF-NORTON COMPANY

P. O. Box 1889 • Pittsburgh 30, Pennsylvania

COFFING HOIST DIVISION: Danville, Illinois

Ratchet Jacks, Screw Jacks, Hydraulic Jacks, Special Worm Gear Jacks, Ratchet Hoists, Electric Hoists, Load Binders, Spur Gear Hoists

field installation or mishandling in use causes this. Since labor costs to repair a casting by the oversize thread method often are more than the casting is worth, all such damaged castings were scrapped.

Then the firm began using 18-8 stainless steel wire thread inserts. These inserts, made by Heli-Coil Corp., Danbury, Conn., now keeps virtually all of the damaged casting from the scrap pile. Last year alone, the center repaired over 150 castings with them.

Machining? No—Employing the inserts permits use of the same size screw in the repaired hole that was used in the original hole. This eliminates machining operations necessary when oversized threads and cap screws are used. It also does away with drilling out larger clearance holes in mating parts.

The inserts have some inherent advantages. They're strong, wear-resistant and corrosion-resistant. They cut inventory costs, too, by permitting continued use of a casting that might not be immediately replaceable from stock.

Forges Big Items

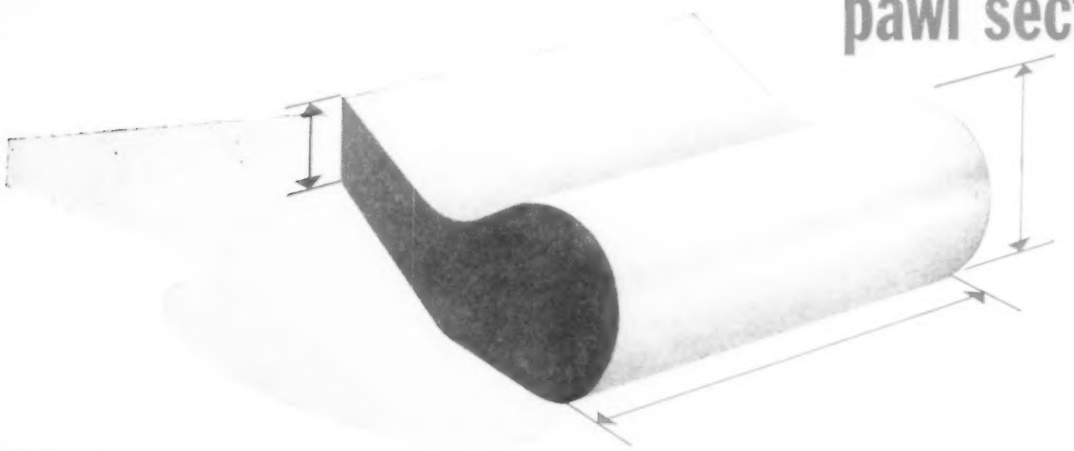
An 8000-lb drop forge unit is producing a variety of heavy steel drop forgings at English Steel Corp., Sheffield, England. The giant hammer weighs about 250,000 lb; it stands nearly 20 ft above floor level. The drop hammer has no boards or belts; its ram is lifted by air or steam and dropped by gravity. Chambersburg Engineering Co., Chambersburg, Pa., and Alfred Herbert, Ltd., Coventry, England, produced the unit.

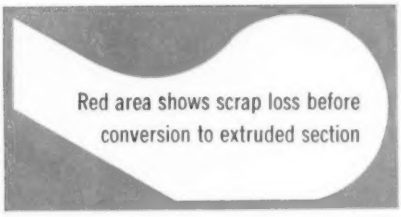
Speed Tests Aluminum

How much can an aluminum component take? That's the question testing engineers are trying to answer. To find out, scientists at the Aluminum Company of America testing laboratory in Cleveland are submitting cast

52% saving

reported with J&L hot extruded cold drawn pawl section





This pawl was previously milled from a ¾" x 1½" hot rolled oil hardening tool steel. Conversion to a cold drawn extruded section cut cost from 45¢ to 22¢ per part.

Here's how extruded sections can cut your cost:

1. Eliminate machining and finishing operations.
2. Reduce scrap losses almost to zero.
3. Eliminate cost of casting and forging intricate sections.
4. Reduce inventories because extrusions are quickly available.

Investigate this new production technique for your shape profiles—within present limits of a design which can be inscribed in a three-inch circle. Available in a wide range of carbon and alloy steels. For specialty alloy and tool steels, submit inquiry. Get complete details by writing to the Jones & Laughlin Steel Corporation, Dept. 403, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin
STEEL . . . a great name in steel

YOU GET more* WHEN
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DISTRIBUTOR

* more dependability

YOU CAN DEPEND ON BUNTING, the Bunting distributor and on Bunting Stock Bronze Bearings and Bars. The very highest standards of metallurgical and manufacturing processes assure uniform high quality in Bunting Cast Bronze and Bunting Sintered Powdered Oil-filled Bronze Bearings and Bars. Bunting distributors are the leading responsible distributors in their respective areas. They carry ample stocks at all times.

Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars—Bronze, and Bearings—Bronze. Two modern Bunting factories and eleven Bunting Branch Warehouses expedite distribution in all areas. Write, or ask for catalogs giving complete dimensional listings and technical data.

Simplified standardized size listing including all ASTM sizes—an exclusive Bunting feature.

Bunting

BUSHINGS, BEARINGS, BARS AND SPECIAL PARTS OF CAST BRONZE AND POWDERED METAL.

The Bunting Brass and Bronze Company • Toledo 1, Ohio • Branches in Principal Cities

aluminum impellers to higher and higher speeds, greater and greater stresses. One such impeller was recently whirled over 2000-mph.

As part of the experiments, testers rotate parts in a specially-designed "whirl pit" until they literally fly to pieces. Reassembled, these bits of aluminum reveal valuable information to researchers.

Welds Magnesium Continuously

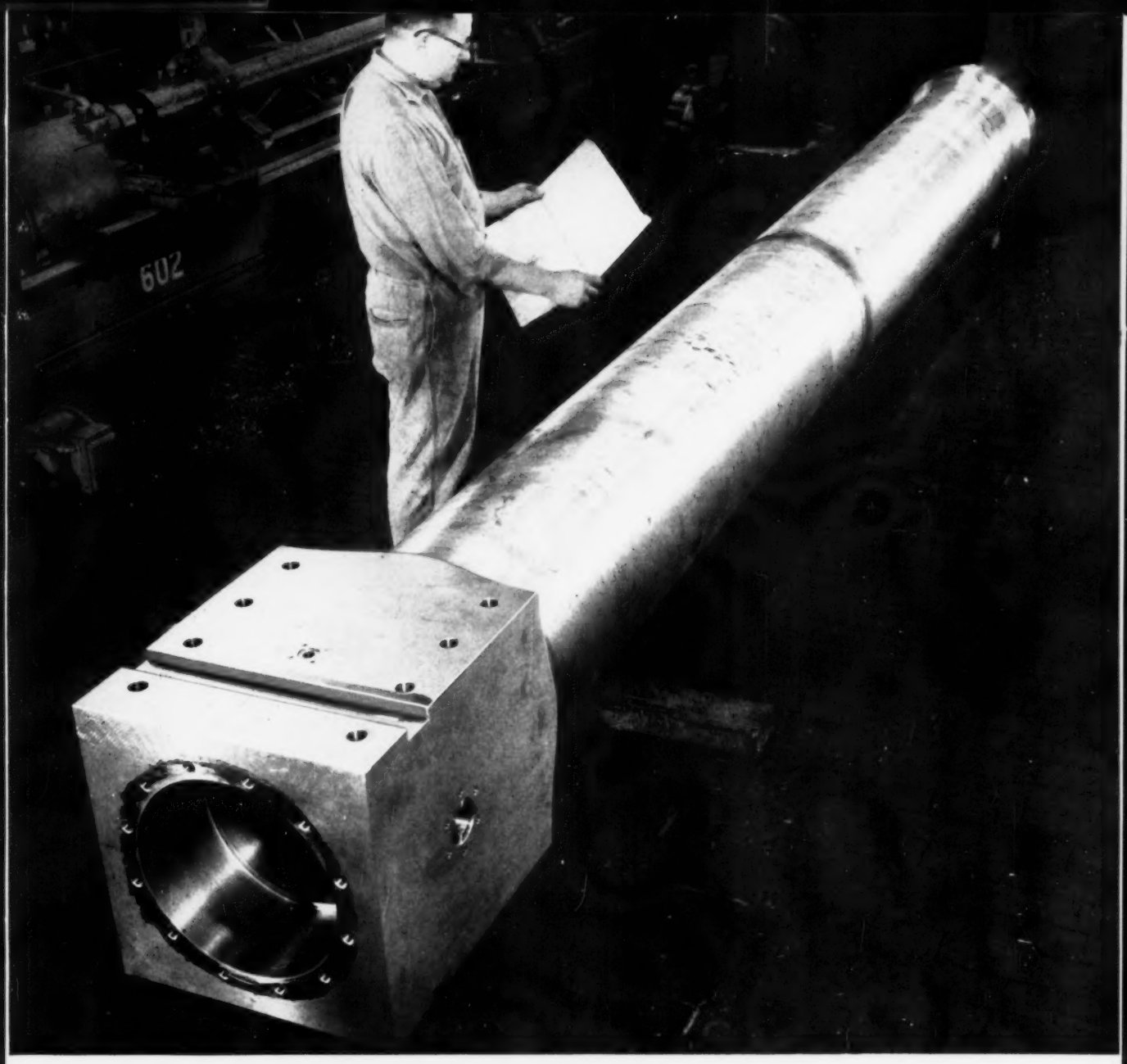
Thanks to an anti-burn-back device, a production fabricator is automatically, continuously welding magnesium. It's done with the shielded inert arc, consumable electrode method.

For some time, Lite-Line Metal Industries Div. of Copperloy Corp., Cleveland, ran into some difficulty

Using a semi-automatic device a welder joins magnesium parts.

in welding the lightweight metal. Maintaining constant electrical contact between the electrode wire and the weld machine's current carrier wasn't easy. It often resulted in "burn back." These caused down-time while maintenance men repaired the welding head.

Uses Hand Welding — Because of the "burn back" harassment, the firm—like many other fabricators—used hand-style welding to join magnesium components. This method is less uniform and slower



A WHOPPER! WHO MADE IT?

A specialist in big forgings, that's who, and that's us . . . one of the very few companies equipped to handle such a big job. When *you* need a cylinder forging like this, we'll do the *whole job,* including final machining, to tolerances as close as ±.001″; or we'll produce in rough finished form with the final machining left to you; or we'll harden and temper the steel, doing the entire job to your exact specifications.

For the hydraulic cylinder in the photo above, we poured an electric steel ingot, forged it, hollow-bored it, lapped it, and polished it to a cylinder finish—we could do all of this . . . do it well and do it economically —because we are specialists and ours is a completely integrated plant. We'll produce *your* big forgings too —exactly to your specifications.

"WHO MAKES THE BIG ONES . . BEST?"

NATIONAL FORGE
AND ORDNANCE COMPANY

IRVINE (WARREN COUNTY), PENNSYLVANIA

To see more of "the big ones," and the machinery they're made on, write for Bulletin NFO-1.

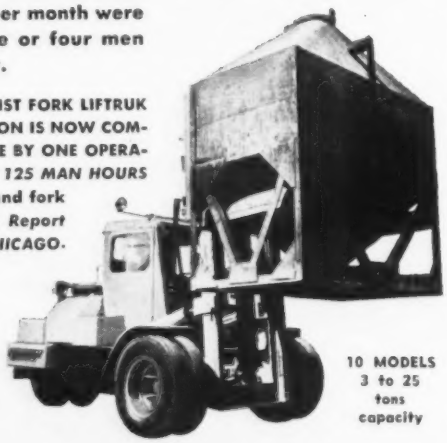
SILENT HOIST LIFTRUK

INLAND STEEL IS SAVING approx. 125 MAN HOURS EACH MONTH on JUST ONE SPECIFIC REQUIREMENT

"Four to six cars of carbide per month were formerly unloaded by three or four men working eight hours per day.

"THROUGH THE USE OF SILENT HOIST FORK LIFTRUK Model FK 7½, THIS SAME OPERATION IS NOW COMPLETED IN A PORTION OF THE TIME BY ONE OPERATOR . . . *SAVING APPROXIMATELY 125 MAN HOURS PER MONTH*" . . . releasing men and fork truck for other useful purposes. *Report from INLAND STEEL CO. EAST CHICAGO.*

SILENT HOIST LIFTRUK is a real work horse — operates long periods without maintenance — on muddy or irregular terrain. STANDARD EQUIPMENT includes Fluid Drive, Power Steering, High Undercarriage, extra large torque multiplier for traction.



10 MODELS 3 to 25 tons capacity

Ask for Bulletin No. 77.

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
851 63rd Street, Brooklyn 20, N. Y.

NON-FLUID OIL
TRADE MARK REGISTERED

Prolongs Life of Ball and Roller Bearings

The ideal lubricant for ball and roller bearings must be strictly neutral and free from any tendency to develop fatty acids which corrode and pit bearing surfaces.

NON-FLUID OIL meets the most stringent tests of bearing engineers. It "stays alive" longer than ordinary greases and does not decompose or become acid to pit or corrode highly polished steel. Furthermore, NON-FLUID OIL provides dependable lubrication over the widest temperature range and outlasts ordinary greases by 3 to 5 times, assuring worthwhile savings in lubricant and application cost. NON-FLUID OIL is used or approved by most leading bearing manufacturers and by hundreds of builders and users of anti-friction bearing type machines.

Send for instructive Bulletin 506 and free testing sample.

NEW YORK & NEW JERSEY LUBRICANT COMPANY
292 MADISON AVE., NEW YORK 17, N. Y.
WORKS: NEWARK, N. J.

1896 61 1957 YEARS OF LUBRICATION SERVICE NON-FLUID OIL TO INDUSTRY

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Columbus, Ga.	Springfield, Mass.	Providence, R. I.
Charlotte, N. C.		St. Louis, Mo.

NON-FLUID OIL is not the name of a general class of lubricants, but is a specific product of our manufacture.

TECHNICAL BRIEFS

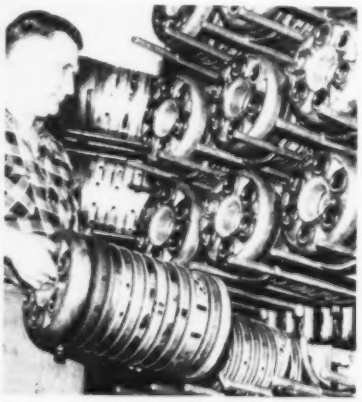
than what the production department wanted. So, the company's engineers set out to find a better method. They did.

Now, the welders employ a new device that solves the "burn back" problem. It makes consumable electrode welding highly feasible for all types of megnesium fabrication, its designers say.

Rapid Joining—Making use of the idea of a small diameter coiled wire as both filler material and electrode, the firm makes continuous production welds up to 30-ft long. And these are now practically routine. Not only this, but welds on a wide variety of magnesium ranging in cross-section from ⅛-in. to heavy magnesium plate are welded successfully. So also are structural shapes and castings.

Plastisol Coat Nils Parts Scratching

Stacking jet burner assemblies on racks coated with plastisol compound prevents the assemblies from



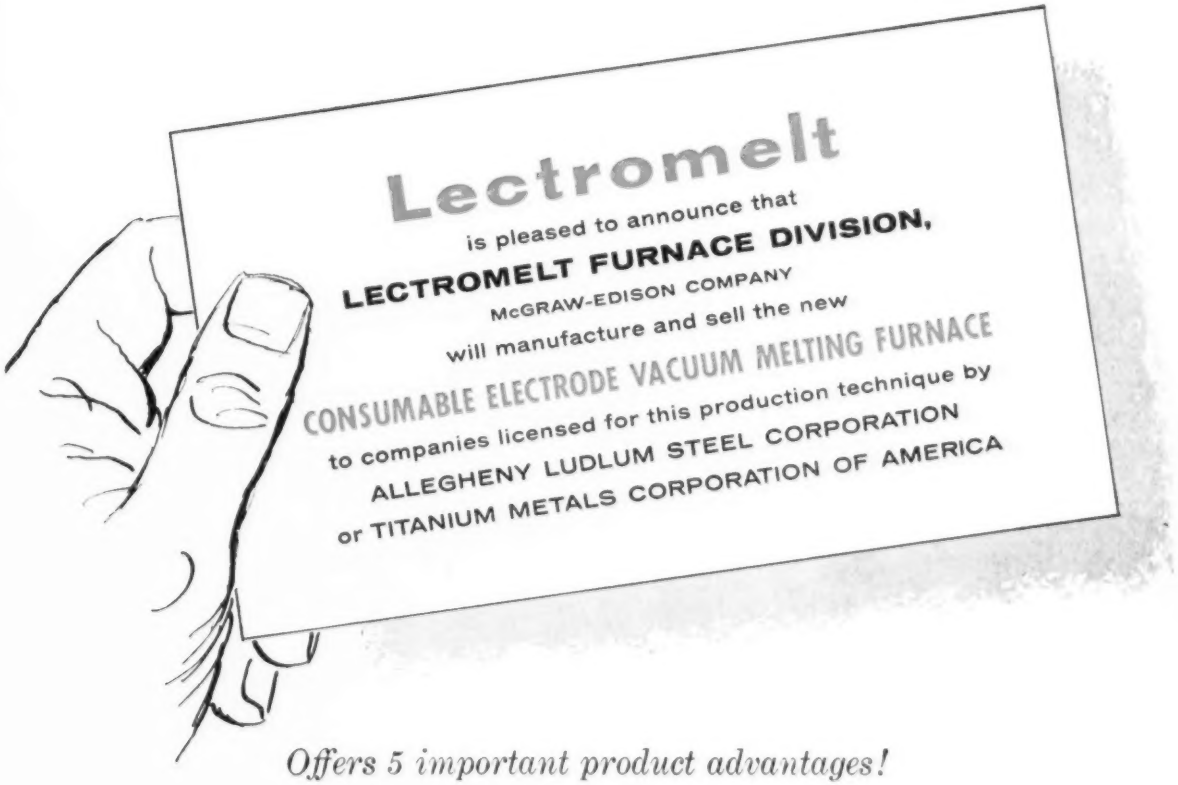
Here, a worker places a unit on a non-scratching rack.

being scratched, thus reducing rejects at Pratt & Whitney Aircraft, Hartford, Conn.

Parts of the assembly are precision machined and polished. Even a minute scratch on any surface requires scrapping of the entire assembly. The resilient plastisol coating protects parts as they are put on

The news is out!

PRODUCTION VACUUM MELTING OF REFRACTORY METALS AND PRECISION SUPERALLOYS


Lectromelt
is pleased to announce that
LECTROMELT FURNACE DIVISION,
McGRAW-EDISON COMPANY
will manufacture and sell the new
CONSUMABLE ELECTRODE VACUUM MELTING FURNACE
to companies licensed for this production technique by
ALLEGHENY LUDLUM STEEL CORPORATION
or TITANIUM METALS CORPORATION OF AMERICA

Offers 5 important product advantages!

Test results on over 300,000 pounds of various nickel-base and iron-base superalloys hardened by titanium and/or aluminum additions show that remelting under vacuum by the consumable electrode process offers these distinct advantages over direct-arc furnace melted materials:

- Higher degree of cleanliness through removal of non-metallic inclusions and excess gases
- Better compositional homogeneity through freedom from segregation
- Improved workability and ingot soundness resulting in increased yields
- General improvement in mechanical properties
- Large homogeneous superalloy ingots at great speed and relatively low cost

For further details on vacuum remelting by the consumable electrode process or for electric furnace engineering service, write to

LECTROMELT FURNACE DIVISION
McGraw-Edison Company
312 32nd Street, Pittsburgh 30, Pennsylvania

and taken from the racks and while racks are transported from one operation to the next.

The racks are spray coated with a Unichrome plastisol made by Metal & Thermit Corp. Several coatings build up thickness to 80 mils.

Hardens Rivet Part; Leaves Rest Alone

Ever try heat-treating part of a tiny rivet while not treating another part of it? It isn't easy. At least, it wasn't easy. Now a chain saw maker turns out up to 7000 partially hardened chain saw rivets per hour.

Like producers facing similar problems, the manufacturer wanted to harden the outside diameter of its rivets while keeping the small axial diameter soft. However, its little size presented an obstacle. When induction heating the items, not only the large diameter got heated, so did the axial diameter.

More Complications—The problem became even more complicated because the large section is in direct contact with the small one. The firm

These small rivets are part heat-treated, part not.

decided to try a new induction unit made by Radio Frequency Co., Inc., Medfield, Mass.

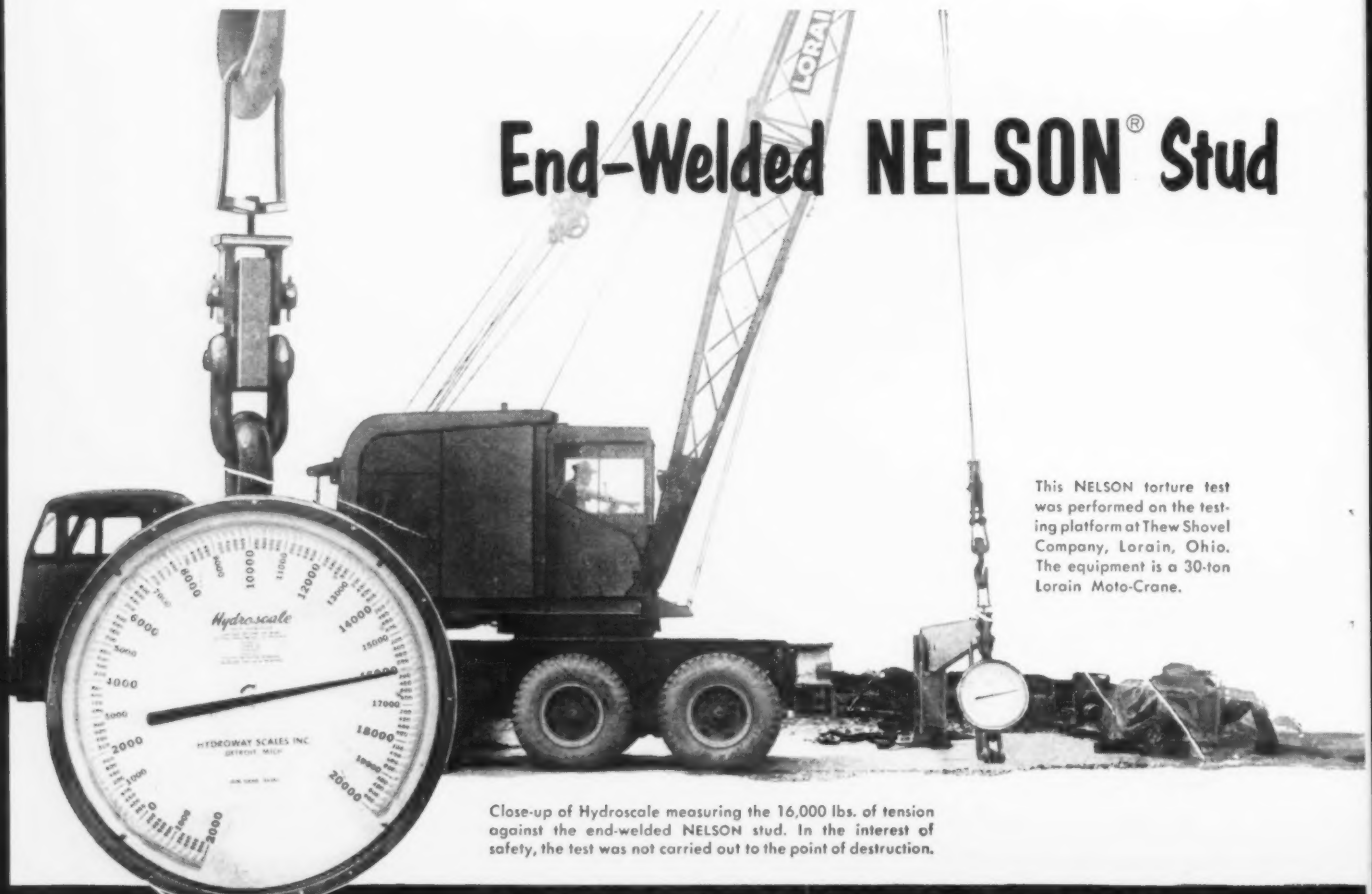
Using the equipment and a newly devised method, the company now pumps heat into the small objects so fast that the parts can be heated to any desired temperature in a stream of water or in oil. This heating under water or oil produces an almost instantaneous quench.

Local Heating—By heating the part in 1/10 of a second or thereabouts and quenching at the same time, a high degree of hardness is obtained. At the same time, the heat is highly localized. Thus, the large diameter of the rivet is heated to hardening temperature while the axial part receives little or no heat.

Hidden Tool Cost Cut

Sometimes it's the hidden cost rather than the obvious cost that costs the most. Here's an example: In machining a shell molded vane type diffuser, tool wear and tool cost had been quite high. So the manufacturer switched to throw-away type cutters.

Tool cost savings registered 0.7-cents per piece instead of the former 2.4-cents. However, the big —and unexpected—savings came from other sources. Not only was


End-Welded NELSON® Stud
LORAIN
Hydroscale
HYDROWAY SCALES INC.
This NELSON torture test was performed on the testing platform at Thew Shovel Company, Lorain, Ohio. The equipment is a 30-ton Lorain Moto-Crane.
Close-up of Hydroscale measuring the 16,000 lbs. of tension against the end-welded NELSON stud. In the interest of safety, the test was not carried out to the point of destruction.
NELSON STUD WELDING . . .

$2.50 of grinding cost per tool eliminated completely, but downtime per tool change was slashed 90-pct from five minutes per tool change to 30 seconds. The saving, in machine hours for tool change downtime per insert reports Wesson Co., Ferndale, Mich., was three times the tool cost.

Moly-Sulfide Smooths Scissors Output

Squirting a little molybdenum disulfide containing lubricant on scissors blanks brings a manufacturer some improvements in its cold forging process.

Thanks to the lubricant, the metal flows while in a 650-ton coining press at Acme Shear Co., Bridgeport, Conn. This results in increased die life, upped production and better finishes on the final pieces.

No Lube; Good Lube—Prior to using the MoS_2 lubricant, the scissors producers used none. The policy was: most lubricants, wet or dry, pile up in the die if used to excess. They sometimes form an imprint on cold-forged pieces.

A squirt of the lube and these scissors blanks work easier.

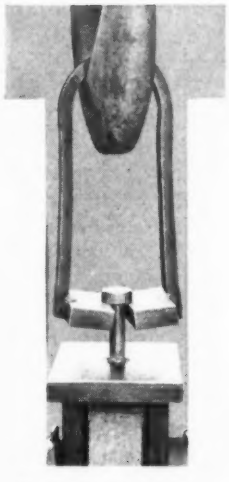
By carefully distributing the moly-sulfide powder, though, the operator avoids any lube accumulation. And he still gets all the advantages of lubrication without damaging pieces.

The material, says Climax Molybdenum Co., New York, is particularly well-suited for such an application since it films out on metals in thin tenacious layers.

Man Is Plant's Key

To be successful, all the detailed techniques for improving steel plant efficiency and product quality should be based on the inherent pride of the individual in his work. So states W. T. Hayter, process control metallurgist of Youngstown Sheet & Tube Co. "Continuity of production," he points out, is a principle aimed at increasing productivity, production and yields, while enhancing product quality at no extra cost. "In effect, it makes better use of equipment and manhours." He aired his views at a recent American Iron & Steel Institute meeting in New York.

Resists 8-Ton Load!



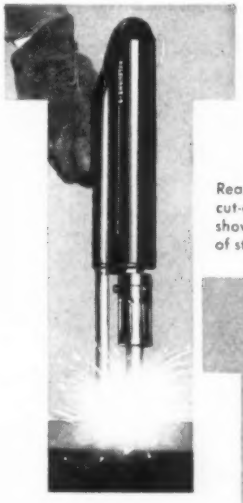
Close-up of stirrup used to complete the linkage between test stud and the crane cable hook. Photo was taken while stud was under full 16,000-lb. load. Bent stirrup indicates force of this grueling test.

• Nelson Engineers tested a ⅝" diameter standard headed stud to determine the strength of the weld.

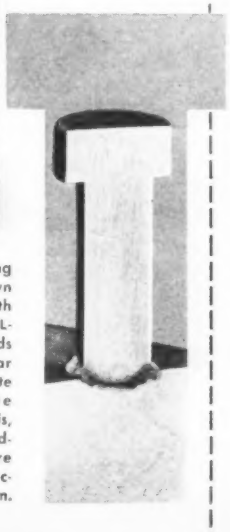
These photographs attest to the amazing tensile strength of a NELSON end-welded stud. Torsion and shear strength are equally amazing.

Holding power like this suggests that it pays to stop before drilling a hole and consider the NELWELD® method of fastening... the system that also saves time, eliminates flanges and bosses and makes "hole engineering" unnecessary.

The manual offered in the coupon goes into detail on design and applications, and recommended torque and tensile loadings of studs for normal applications.



Reason for strength... cut-a-way view of stud shows complete fusion of stud and base plate.



The headed stud being used in this test is shown being stud welded with the portable NS-9 NELWELD Gun. These studs are often used as shear connectors on concrete and steel composite bridges. Threaded studs, and a multitude of standard types and sizes are available for manufacturing and construction.

***NEW* NELWELD DESIGN MANUAL**

yours for the asking. Write your name, company, address in this space, and send to NELSON.

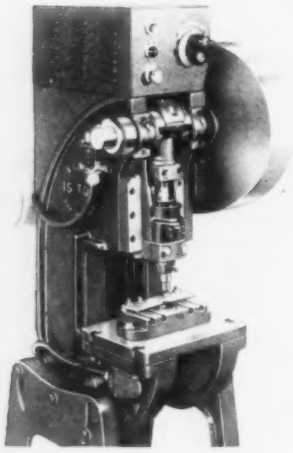
***Fasten It Better* at Less Cost with**

NELWELD

Division of Gregory Industries, Inc., Lorain, Ohio

New Production Ideas

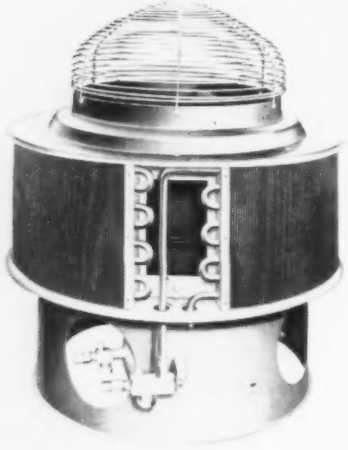
Equipment, Methods and Services



Punch Press Safety Features Prevent Accidents

This 15-ton punch press boasts several fool-proof safety features. It's designed to keep production up and accidents down. A few of its safety assets include: (1) To single-trip the machine, the operator must depress two widely spaced buttons at the same time; this keeps both hands safely occupied. (2) The flywheel idea is eliminated; in single stroke operation, both press and motor go dead after the stroke; this does away with stored energy, double tripping hazards. (3) A selector switch, which sets the press for single-trip, continuous and other type operations, is locked in position by authorized personnel; thus, the operator cannot "fudge" or devise dangerous shortcuts by varying the setting. (4) The absence of a standard clutching operation eliminates loud noise and the hazards sometimes associated with mechanical clutching. (5) The 15-ton punch press unit utilizes a heavy-duty safety brake that goes into action when its power fails. (Kenco Mfg. Co.)

For more data circle No. 42 on postcard, p. 117



Air Conditioners Boast High Heat Transferring

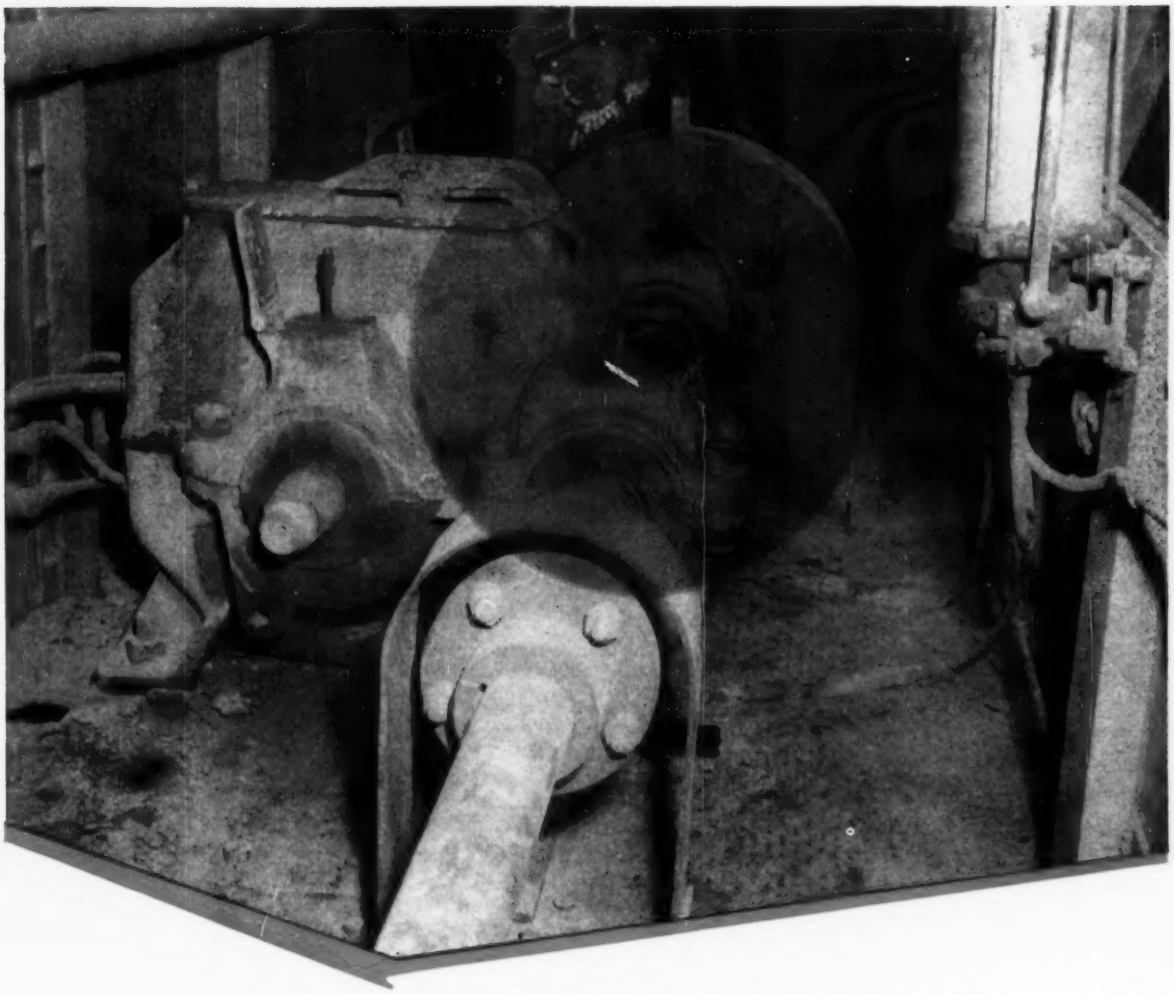
Engineered for high heat transfer efficiency is a new line of circular coil air cooled condensers. The dry type condensers use no water or spray to condense refrigerants. Only outside air induced through the unit's circular coil is used for condensing purposes. This makes the air-cooled condensers good for application in areas where water is scarce. Designed for out-of-doors installation for remote connection to an air conditioner inside, the units come in three standard sizes. They are used singly with 3, 5 and 7½-hp package type air conditioners, and in multiple combinations with larger horsepower conditioner equipment. Top feature of the setup is its heat transfer performance. This results from a special one-row circular coil and a broad blade propeller fan for draw-through air circulation. Another feature of the air cooled condensers is the ease with which the units can be installed. (The Trane Co.)

For more data circle No. 43 on postcard, p. 117

Light Blower Speeds Magnetic Particle Tests

Completely self-contained, a lightweight powder blowing unit is highly portable. It operates directly from any air line and requires only 20-psi pressure. A simple adjustment controls the density of the cloud of powder. Two push buttons permit selection of either powder or clean air. By holding the gun level at a distance from the area being tested, particles gently flood the entire area, showing clear indications when cracks are present. This blower is very compact and weighs just 2¼ lb when empty. Simple to operate, it offers a quick method of magnetic particle inspecting over a wide area. (Magnaflux Corp.)

For more data circle No. 44 on postcard, p. 117



OVER 20 YEARS OLD . . . yet Bearings, Inc. delivered replacement bearings for these back axles from stock

Our steel mill customer had torn down the motors on his 160 ton open hearth ladle crane for a complete overhaul. These motors were equipped with back axles mounted on roller bearings which had to be replaced.

Our bearing engineer was called when the customer couldn't identify the bearings or the outer races. Our engineer quickly determined that the roller assembly was a standard size and make. He also found that the outer race was a special we had recently supplied another company through a custom manufacturing source.

One pair of these special outer races was still in stock and was delivered immediately with the bearing! The complete order for several pairs was filled within a short time.

This customer now knows what we mean when we promise service! He didn't have too much hope of replacing this assembly from the bearing manufacturer—and finding a complete set in a local stock was not even considered!

You can get to know this kind of service for all nationally known bearings and bearing accessories if you will call the branch nearest you!

Providing bearing service in the territories adjacent to our branches, listed below.

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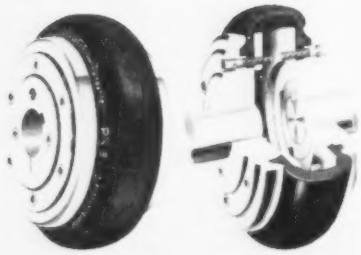
OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
PENNSYLVANIA: Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
DELAWARE: Wilmington •
Subsidiaries: Balanrol Corp. • Buffalo, N.Y.•
Kentucky Ball and Roller Bearing Co. • Louisville, Ky.

Close-up Air Hose Blows Chips From Workpiece

Here's an air-hose setup for clearing away cuttings that eliminates dangling, tangling lines. The magnetic hose nozzle holder clamps to machine tools at the point of use. It reduces accident hazards created by hoses that hang from overhead hooks or writhe on shop floors. The device consists of a pliable rubber nozzle fastened to lifetime Alnico magnets of 110-lb or 35-lb pulling power. Slight, one-finger pressure starts the flow of air through the nozzle; air shuts off as pressure is released. Ability to place the hose nozzle at the point of use means an operator doesn't have to step away from his machine to reach for an air hose that sometimes hangs dangerously from an overhead support or coils at his feet on the floor. The device also can adapt to position coolant tubes. (Dilley Mfg. Co.)

For more data circle No. 45 on postcard, p. 117



Flexible Coupling Simplifies Power Transmission

A new idea in flexible couplings comes to light with the introduction of this piece of power transmission machinery. Its ability to handle angular misalignment, parallel misalignment and end-float—in any combination—is only one of many advantages claimed for the coupling. The flexible member also cushions shock loads and diminishes torsional vibration. This protects both the driver and the driven machine. Heart of the coupling is a tire with synthetic tension members bonded in rubber. (Dodge Mfg. Corp.)

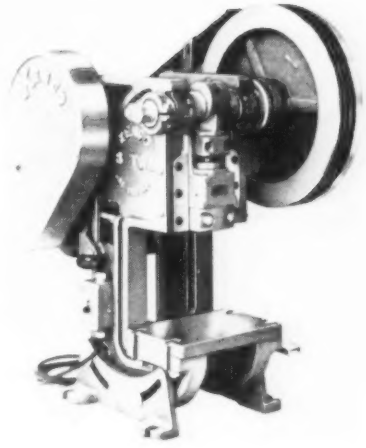
For more data circle No. 46 on postcard, p. 117

A Farewell to
CADMIUM
BLISTERS
See these blisters? We have to scrap almost all these parts. We're not getting the cutting oil off in the spray washer.
Hi, Jack, looks like I got here just in time!
"Say, Burt, how did Pennsalt develop this cleaner?" "Well, Jack, nobody knows more about metal-processing chemistry than Pennsalt. Our Whitemarsh Research Lab is constantly working on problems like yours, and Cleaner 38 is just one of their outstanding successes. By the way..."
. . . you can store these parts for a day or so before putting 'em on the plating line. The unrinsed cleaner film will prevent rusting.
Fine—I won't have to keep both lines running together now.

Slow-speed Punch Press Operates Quietly

Quiet operation and quickly varied working speeds are major features of this 8-ton slow-speed punch press. It's designed primarily for hand feeding, deep drawing, continuous operation, high-accuracy roll feeding and dial feeding. Speed is normally 90 strokes per minute. Other speeds from 50 to 200 strokes per minute are readily available by changing a single pulley wheel. A new belt-drive setup transmits power smoothly and cuts out loud noise generally associated with punch presses. The drive mechanism features two flywheels: the first one creates the driving momentum and transmits it to the final drive pulley. The large diameter final drive pulley overcomes belt slippage problems; it transmits all of the power generated by the initial flywheel via multiple high-friction cog-type friction belts. A jack-shaft connecting the machine's twin flywheels operates on precision ball bearings (Kenco Mfg. Co.)

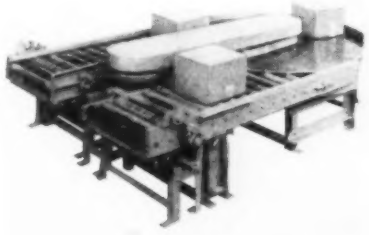
For more data circle No. 47 on postcard, p. 117

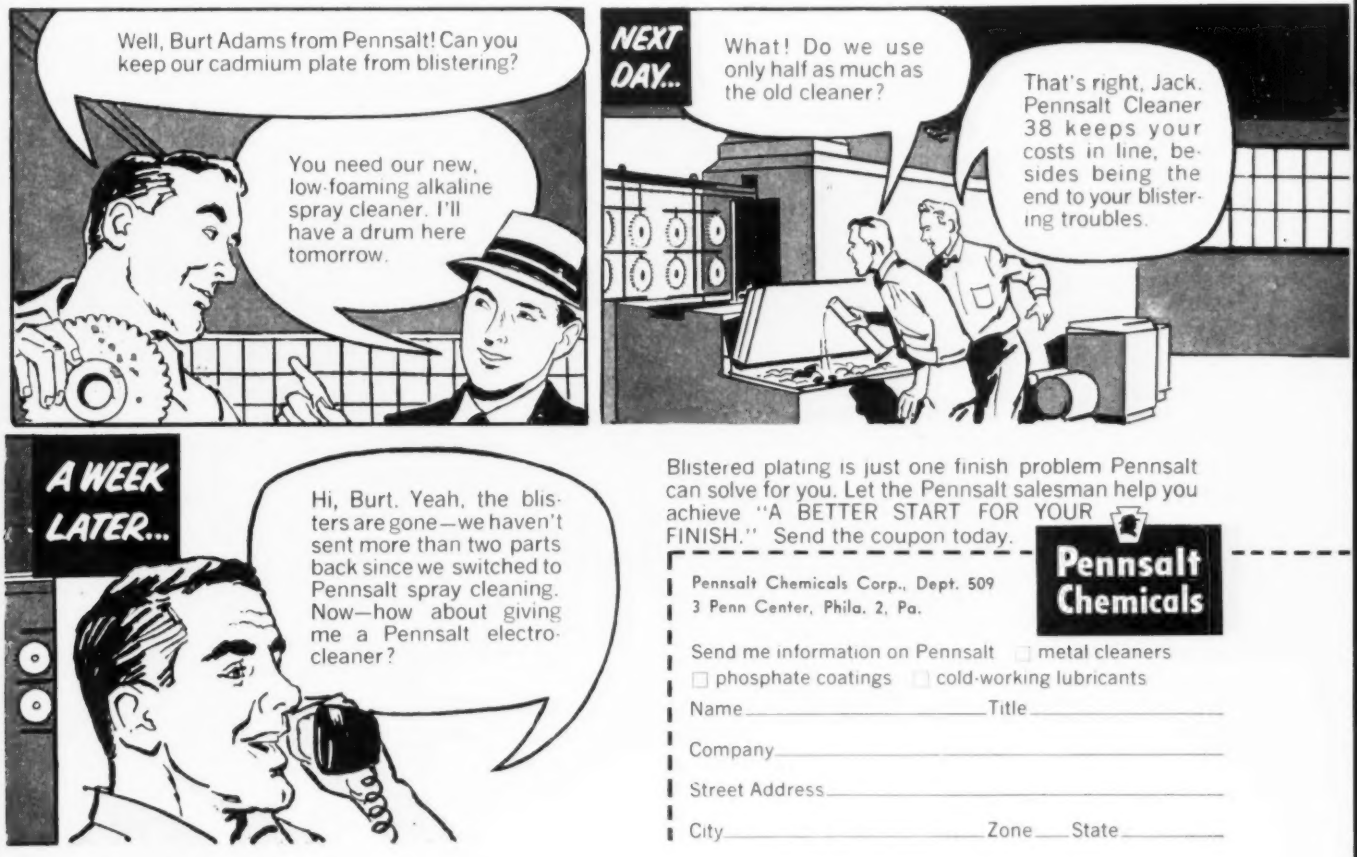


Conveyor Turntable Turns Item In Small Space

This conveyor turntable transports cartons, cases and packages through a 180° turn in less space than required by conventional powered conveyor curves. It is particularly adapted for installations in narrow areas. Designed for use in either live roller or powered belt conveying systems, this turntable features an endless traveling inner guide belt which ensures correct tracking of cartons or cases throughout the turn, and proper discharge onto the receiving conveyor line. (Alvey-Ferguson Co.)

For more data circle No. 48 on postcard, p. 117




Well, Burt Adams from Pennsalt! Can you keep our cadmium plate from blistering?
You need our new, low-foaming alkaline spray cleaner. I'll have a drum here tomorrow.
NEXT DAY...
What! Do we use only half as much as the old cleaner?
That's right, Jack. Pennsalt Cleaner 38 keeps your costs in line, besides being the end to your blistering troubles.
A WEEK LATER...
Hi, Burt. Yeah, the blisters are gone—we haven't sent more than two parts back since we switched to Pennsalt spray cleaning. Now—how about giving me a Pennsalt electrocleaner?

Blistered plating is just one finish problem Pennsalt can solve for you. Let the Pennsalt salesman help you achieve "A BETTER START FOR YOUR FINISH." Send the coupon today.

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Send me information on Pennsalt ☐ metal cleaners
☐ phosphate coatings ☐ cold-working lubricants

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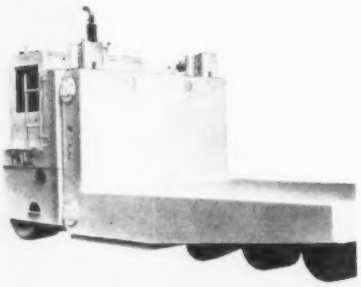
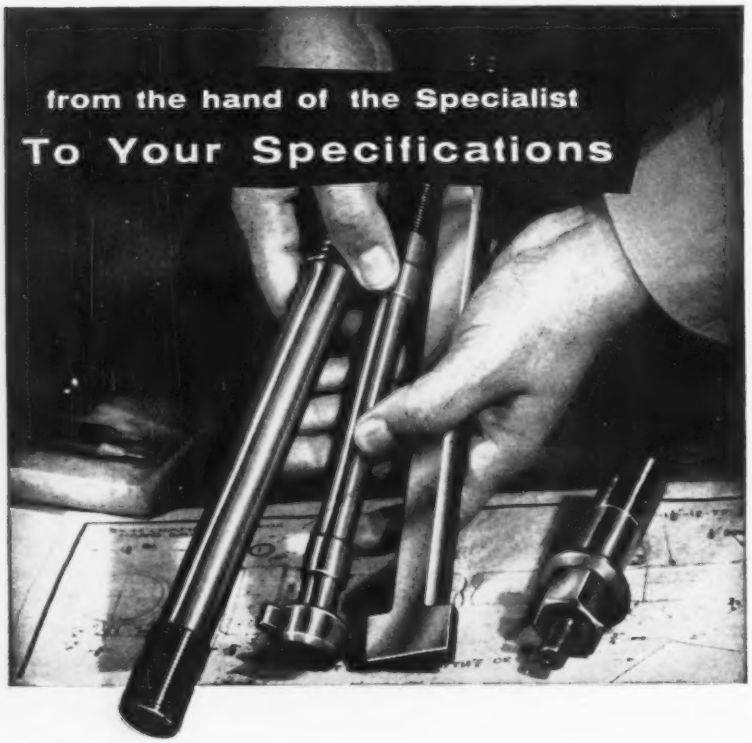


Electric Platform Truck Lifts Big Loads

If it's big loads you're needing to get hauled, here's the truck to do the job. This high lift diesel electric platform truck handles up to 200,000-lb loads. Its large capacity makes it handy for lots of big jobs, like hauling huge dies between presses, etc. The truck betters by 40,000-lb in capacity any other model turned out by its maker. Its total weight is 77,000-lb. Length is 21 ft 4 in. Its die carrying platform measures 13 x 8 ft. The truck provides a 2 ft 4 in. lift hydraulically. An International diesel engine-generator unit powers it. (Yale & Towne Mfg. Co.)

For more data circle No. 49 on postcard, p. 117



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Subsidiary of
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REPUBLIC INDUSTRIAL CORPORATION

ERIE BOLT & NUT CO.
Erie, Pennsylvania
Representatives in Principal Cities

Stud Driver

An improved collet-type stud driver-remover doesn't damage studs when either driving or extracting them. The tool comes ready for hand operation, or to be powered by any standard drive torque unit. It reverses without removal from the stud. Collets with which it's used can be changed in less than 30 seconds. Collet sets are available to fit all standard studs to ¾-in. diam. (E. V. Nielsen, Inc.)

For more data circle No. 50 on postcard, p. 117

Flame Cutters

Increased flame-cutting speeds are promised for a line of Oxweld two-piece nozzles. Designed for

flame-cutting with oxygen and fuel gases, each of the two-piece nozzles has from 12 to 20 extremely small outlets for preheat gases. This increases the rate of heat transfer and produces a nearly solid ring of preheat flames. Gases usually leave a cutting nozzle at a speed of about 980 fps. However, the new

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Round, square, oblong Punches, Dies and Rivet Sets carried in stock.

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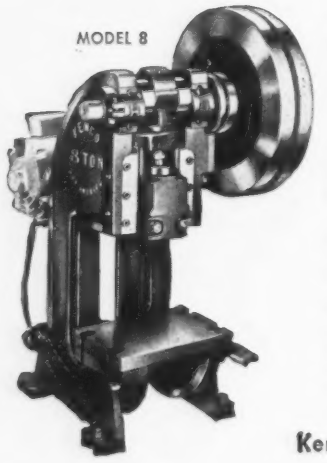
KENCO 8-TON
PRECISION-BUILT
PUNCH PRESSES

MODEL 8



...rugged, fast and trouble-free

They're Kenco-built with long-wearing parts *throughout* to eliminate downtime and give you *many extra* years of steady, low-cost production. Rigid, multiple-rib frames and extremely long ram ways assure high precision production. Driving mechanism engineered for trouble-free operation. Press is competitively priced.

Model 8-R—8-ton deep-throat, Rigid-Rib

Same construction features, but with 12¾" throat, and tremendous resistance to breakage, deflection, or torsional twist.

Kenco presses—14 models—2 to 15 tons
Write for literature

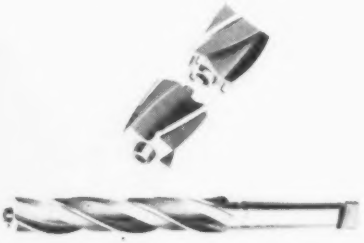
KENCO *MANUFACTURING CO.*
5211 Telegraph Road, Los Angeles 22, California

NEW EQUIPMENT

Oxweld nozzles have a divergent bore design that boosts this speed to 1200 fps. This substantially increases cutting speeds. (Linde Co.)
For more data circle No. 51 on postcard, p. 117

Core Drills

Two piece core drills are now available from stock in 21 small sizes from ¾ to 1⅜-in. The two-piece core drills incorporate a drill body and high-speed or carbide-tipped replaceable cutters. The cutter is secured to the body of the



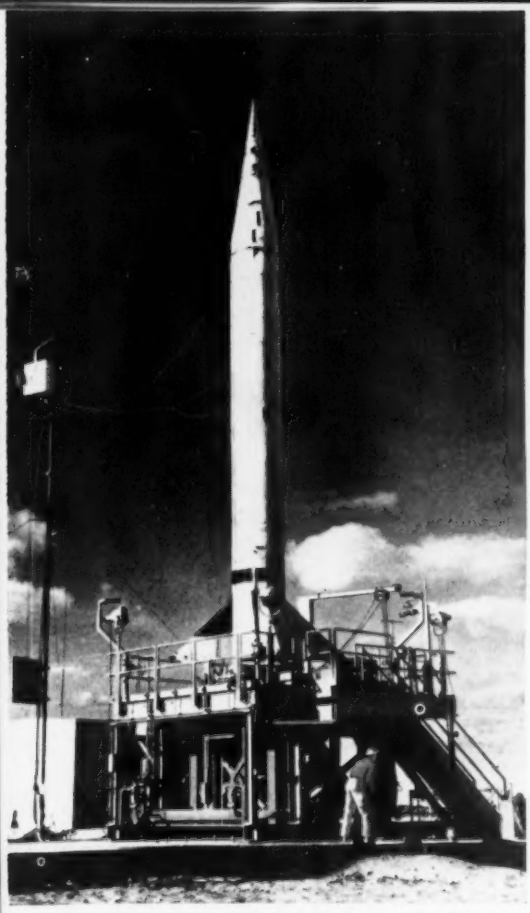
drill by a simple Allen head cap screw. The replaceable tips are accurately positioned on a ground boss and driven by three pins. One pin is in the center of each flute. Precision ground mating surfaces provide a flush fit. (Metal Cutting Tools, Inc.)
For more data circle No. 52 on postcard, p. 117

Turret Lathe

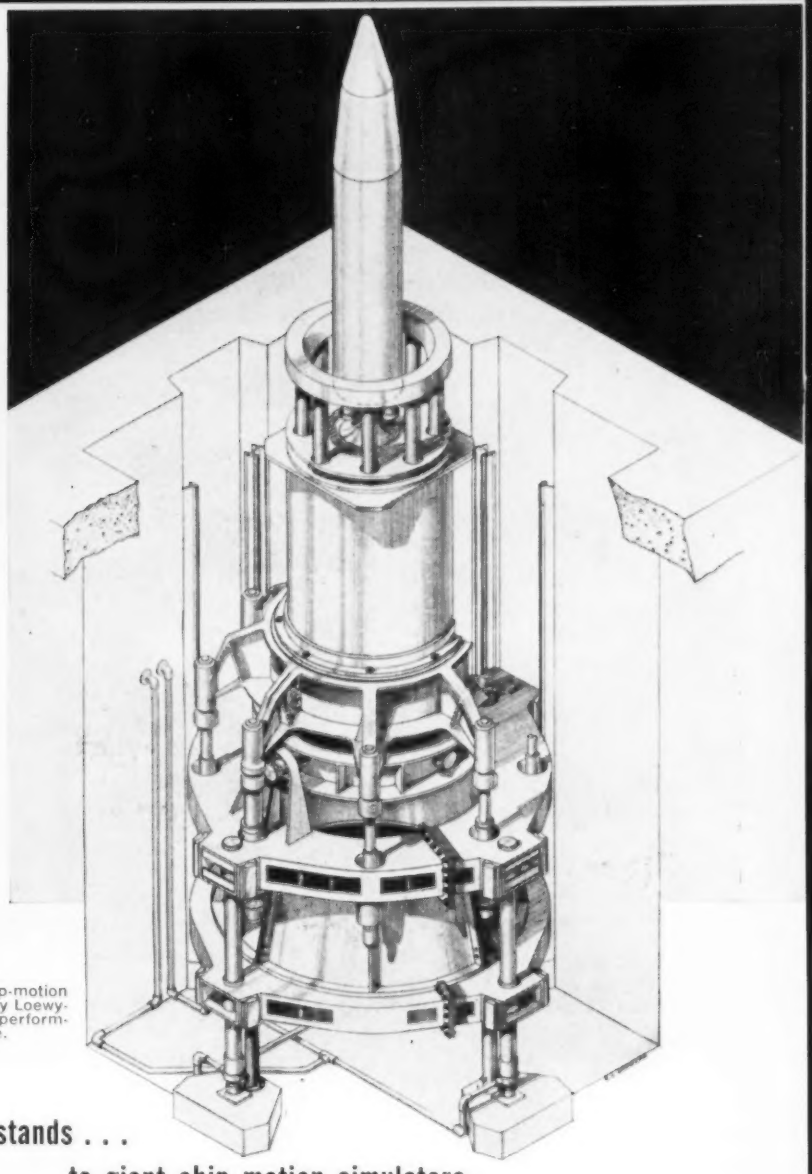
With a 36-in. swing, a new extra heavy-duty saddle type turret lathe performs precision, high production metal turning on large size workpieces. The lathe features a 75-hp, 2-speed main drive motor. This is coupled to the spindle through an automatic, hydraulic-shift preselector headstock. With this drive motor and headstock combination, the new machine offers 28 unduplicated turning speeds, from 10 to 280 rpm. (Warner & Swasey Co.)
For more data circle No. 53 on postcard, p. 117

Mill Motor

Built to AISE standards, this auxiliary mill motor is a 500-hp



Static testing and launching stand for Vanguard Earth Satellite and Rocket designed and built by Loewy-Hydropress. Prime contractor—The Martin Company, Baltimore.



Engineer's isometric drawing of ship-motion simulator, designed and being built by Loewy-Hydropress, which will evaluate the performance of the Navy Fleet Ballistic Missile.

From static testing and launching stands . . .

to giant ship-motion simulators . . .

Loewy-Hydropress creative engineering finds the solution

Loewy-Hydropress, which designed, built and installed the static testing and launching platform for the earth's first man-made satellite, has designed and is now building an enormous simulator to duplicate ship motions for the Navy Fleet Ballistic Missile Program. Involving several significant advances in the concept of automatic control of large forces, this simulator will be used for the purpose of checking guidance and fire-control systems, as well as handling, checkout, and actual firing procedures for ship-launched missiles.

The major function of the simulator will be to determine the limiting conditions under which a missile can be safely launched from a moving platform without interference from that platform. In so doing, this elaborate device will duplicate a periodic roll and pitch in any direction while simultaneously producing a heave motion. The simulator's supporting auxiliaries and environment—also by Loewy-Hydropress—will help create an integrated, functional and versatile research tool for the Navy.

The same talents responsible for the earth satellite launching platform and the ship motion simulator are available to help you solve your missile ground-support problems. Whether test facilities, or launching stands, or a combination of both, Loewy-Hydropress will supply a complete ground handling system.

If your missile contracts require creative engineering and design, research and development, direct your inquiries to us, Dept. A-7.

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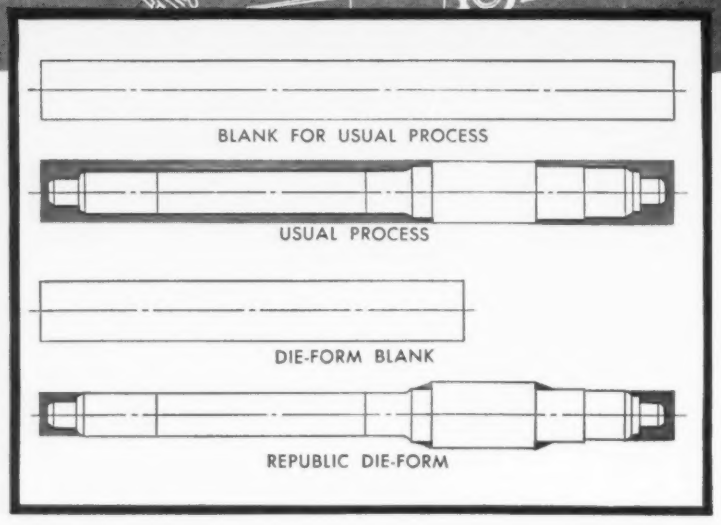

YOU CAN SAVE UP TO 1 OUT OF 3 TONS OF STEEL

when you specify Republic Die-Form for high-volume production of multi-diameter machine shafts. Drawings and photographs show dramatic savings actually made possible in an automotive transmission shaft. In this case, 200 tons of cold formed blanks produced parts formerly requiring 300 tons. Machining time was reduced accordingly.

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REPUBLIC DIE-FORM

What It Is. The Republic Die-Form process is a new method of cold forming hot rolled carbon, alloy, or stainless steel bars into multi-diameter bars ready for final finishing.

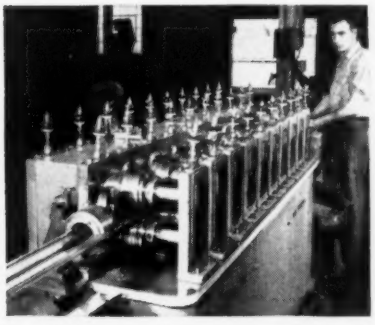
What It Does. Use of Republic Die-Form instead of conventional bar stock permits major savings in time, steel, and money in mass produced, multi-diameter machine shafts. Since Die-Form closely approximates the final part, only finishing cuts and or grinding are required for completion. Scrap loss is minimized—production rate increased.

Savings in time and steel mean dollar savings. However, costs may be further reduced through decreased capital investment in machine tools, and elimination of excess weight-handling costs in raw material and scrap disposal.

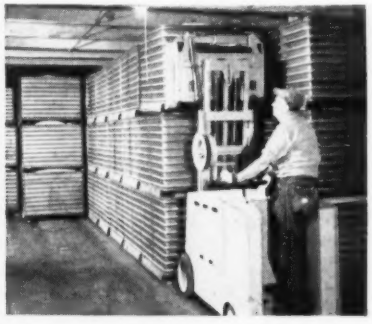
Finally, Republic Die-Form processing increases tensile strength and machinability of any given hot rolled steel analysis used. These characteristics assure an outstanding surface on completed parts, provide further reductions in machining time and permit the possibility of heat treatment elimination.

Capacity and Limitations. Republic Die-Form is available up to two inches in diameter. It is limited to symmetrical cross sections of two or more diameters. "Hourglass" sections cannot be produced. Die-Form is economical only in large production runs.

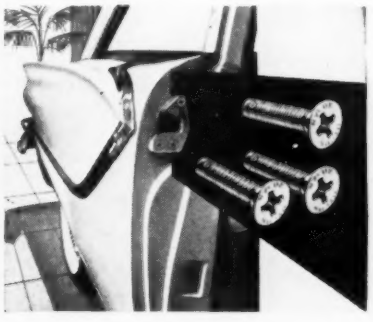
Plan now to check the savings potential of Republic Die-Form in your machined shaft production. Contact your Republic office for full details. Or write for illustrated literature, ADV-746.



SAVE PAINT PREPARATION COSTS on your formed steel products by specifying Republic Electro Paintlok®. Special paint-holding surface is applied at our mills. It won't crack, flake or peel, even under severe bending, as demonstrated by this acoustical fastener forming operation. Final finish can be applied immediately, with excellent results. Mail coupon for data.



TIME, LABOR, AND SPACE SAVINGS were all realized through use of Republic Roll-Over Boxes for this bulk chemical handling operation. Former laborious methods involving bagged material were eliminated. Now one man with revolving-fork truck does the job faster, more efficiently. Check advantages of Republic's complete materials handling line. Send coupon.



LIFESAVING DOOR LATCH striker plate is permanently anchored to door post with Republic Nylok® Bolts. Nylon pellet in body of bolt forces strong metal-to-metal lock between opposite mating threads. Resiliency of pellet provides excellent adjustability and re-use characteristics—and provides liquid seal when bolts are seated. Send coupon for facts.

STEEL

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Please send me more information on:
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But automatically checks with TIME, LINE and COLOR control

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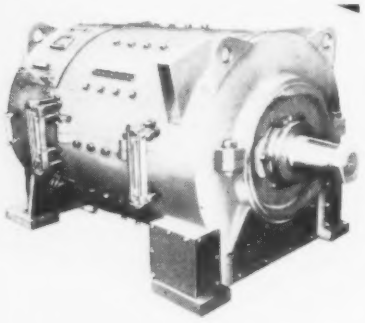
NEW EQUIPMENT

unit. The 230-v, shunt wound motor's armature and field coils are fully class-H insulated. Its frame is of heavy rolled steel, split for good accessibility. Frame heads of the 340-rpm motor have integrally cast



feet for easy repair or storage of the armature and frame head assembly. Constant force brush springs maintain even pressure throughout the unit's brush life. (General Electric Co.)

For more data circle No. 54 on postcard, p. 117

High Speed Lathe

For high speed working, a new geared head precision lathe employs a direct multiple V-belt motor-drive. Start, stop and reverse of the spindle is operated by double multiple disk friction clutch. Its headstock is all-geared with hardened and ground gears. It has 18 spindle speeds, ranging from 15 to 1500 rpm in geometric progression. It is $2\frac{5}{8}$-in. spindle-bored throughout. The machine tool is made in Belgium. (Parker Machine Co., Inc.)

For more data circle No. 55 on postcard, p. 117

Gloves

Two new types of protective gloves are available from one maker. They include: (1) a knit wrist, fully-coated glove in women's

sizes; (2) a long (14½-in) fully-coated gauntlet for men. These liquid-tight gloves protect workers' hands against abrasion or harmful substances. (Pioneer Rubber Co.)

For more data circle No. 56 on postcard, p. 117

Tracing Paper

Here's good news for draftsmen in metalworking firms. It's tracing paper and cloth printed with non-reproducible lavender cross-section guide lines. By serving as guides, the lines speed and improve hand lettering, ruling, measuring, and scaling on original drawings. Prints made from originals show only lines drawn by the draftsman. The product comes in two forms: printed on transparentized 100-pct rag tracing paper whose surface accepts both pencil and ink, and printed on water-repellent tracing cloth which is impervious to perspiration stains. (Charles Bruning Co., Inc.)

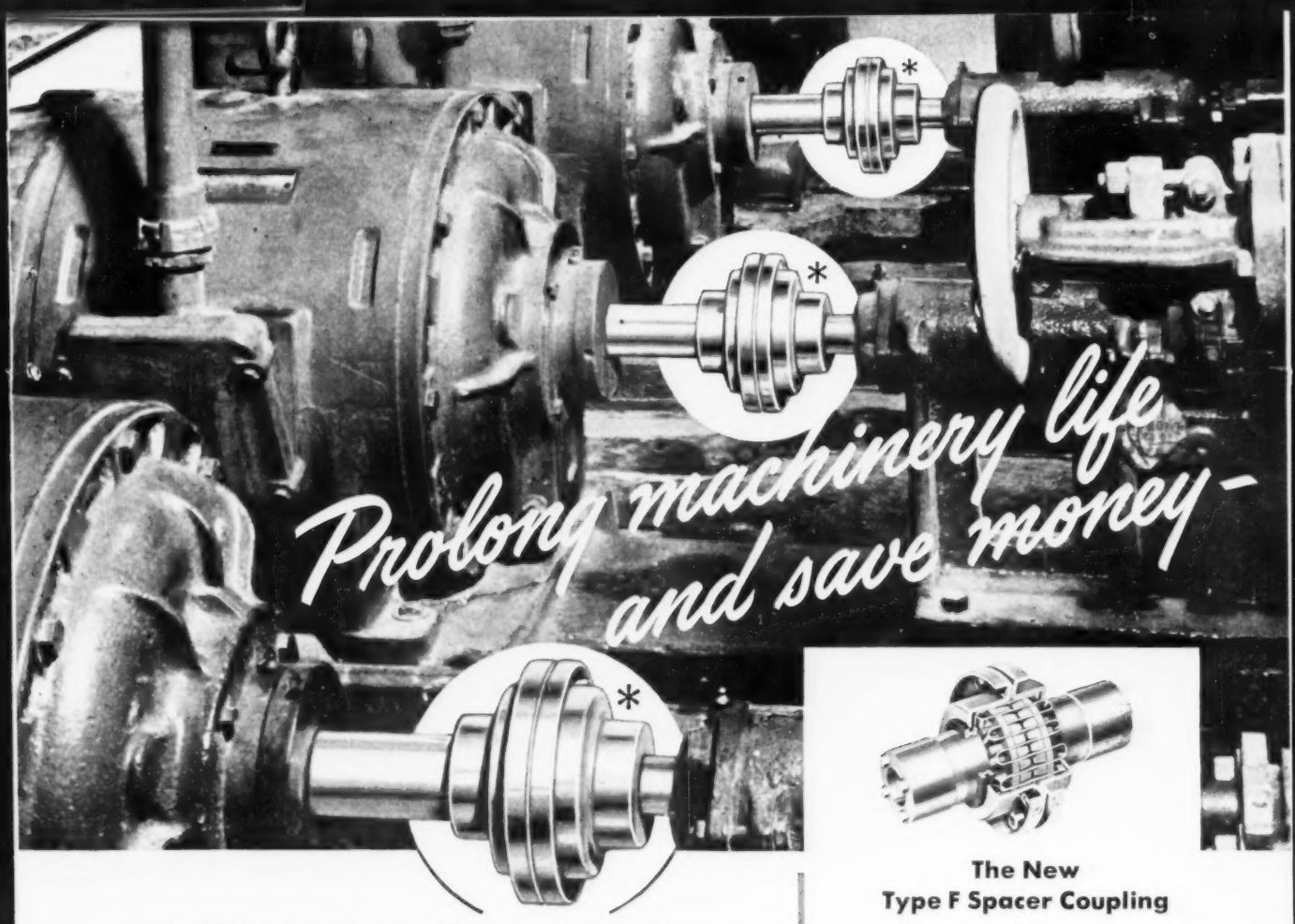
For more data circle No. 57 on postcard, p. 117

DESIGNED FOR DESIGNERS

Designers are often stumped when looking for new methods and new materials to dress up products. The inclusion of Hendrick perforated metal in product fabrication not only helps increase a product's overall attractiveness but also adds to its saleability as well! Perforated metal, masonite, rubber, plastic, and insulated board can be used in the design of: automobiles, furniture, buildings, appliances, notions, novelties, machines, equipment, and other products. Hendrick has hundreds of attractive designs to choose from. In Commercially rolled metals and gauges to meet exact needs.

HENDRICK
MANUFACTURING COMPANY
37 Dundaff Street, Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring—Shur-Site Treads • Armorgrids • Hydro Dehazers • Petrochemical Column Internals



with FALK Steelflex Couplings

Ever since the first Falk Steelflex Coupling was designed and built, we have firmly held to these beliefs:

1. A coupling, to give fullest value, must do more than merely *connect* driving and driven machinery—it must *protect* the machinery and prolong its life.

2. A coupling, to be truly flexible, must overcome the effects of shock and vibration, as well as shaft misalignment.

Proof of the soundness of those beliefs is furnished by the record. More than one million Falk Steelflex Couplings have been used on every conceivable type of industrial application . . . giving trouble-free service, providing maximum protection to connected machinery.

* A single basic type—the famous Type F—fills 90% of all industrial application needs. It is versatile, efficient and economical. And—it is always available from factory, field or distributor stocks, in a wide range of sizes.

Write to Department 247 for engineering bulletin, including selection and dimension tables.

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

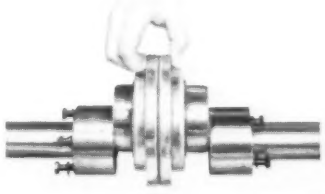
...a good name in industry

The New Type F Spacer Coupling

Here is a Steelflex coupling specially designed to permit fast, easy installation and removal in horizontal and vertical applications where it is impracticable to move the connected units—or where a space-gap (up to 12 in.) is necessary.

Like all Steelflex couplings, the Type F Spacer gives long, trouble-free service and maximum 3-way protection for connected machinery: it provides torsional resilience to reduce shock and vibration; it accommodates parallel or angular shaft misalignment; it allows free (or limited) end float.

An outstanding feature of the Steelflex Spacer is that it can be installed or removed in one piece (see photo below); no dismantling or servicing of the coupling is required. Pump assemblies can be disconnected and removed without disassembling the coupling, without exposing working parts.



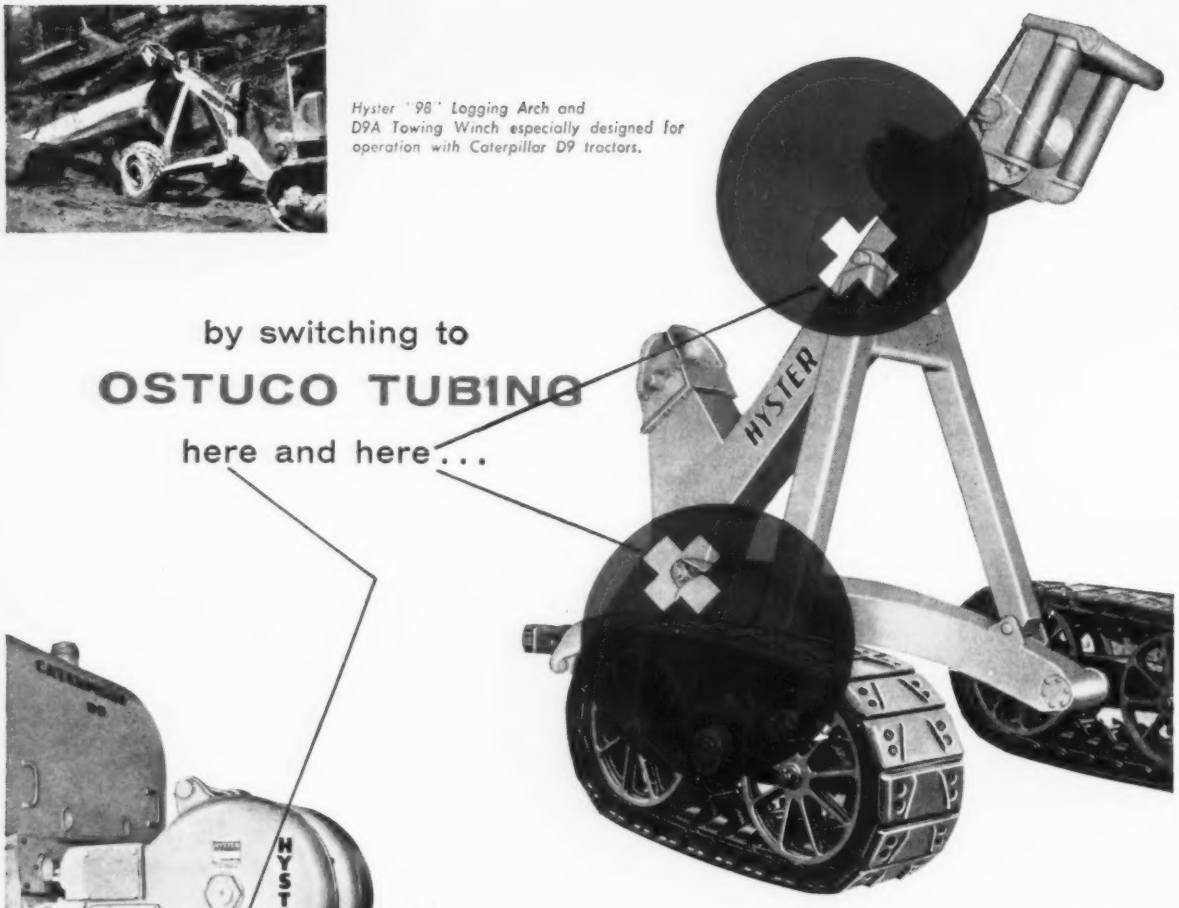
The Steelflex Spacer coupling is prelubricated at the Factory and can be installed, or removed and reinstalled, without disturbing the lubricant—a highly desirable feature.

Hyster "98" Logging Arch and D9A Towing Winch especially designed for operation with Caterpillar D9 tractors.

by switching to

OSTUCO TUBING

here and here...



Hyster Company Makes Double-Cut on Costs!

Hyster Company, Portland, Oregon, out to beat machining costs of components in their logging arches and winches and a drawbar bracket, turned the trick by switching from another material to OSTUCO Seamless Steel Tubing.

Drawbar Bracket—Use of OSTUCO Tubing cut material and machining costs from $120,500 to $81,820 annually for a reduction of 32%.

Logging Arch—Used as sleeves in the Hyster "98" Arch, OSTUCO Tubing reduced material and manpower costs 10% annually.

In addition, Hyster engineers report the equipment is stronger and better able to take the strain of heavy hauling and winching jobs over rough logging terrain.

Perhaps you have hidden profit-robbers in your product. Better contact OHIO SEAMLESS for recommendations . . . without obligation on your part, of course.

OSTUCO TUBING

MANUFACTURED IN

SHELBY, OHIO

EXCLUSIVELY BY

OHIO SEAMLESS TUBE DIVISION

OF COPPERWELD STEEL COMPANY

SHELBY, OHIO • Birthplace of the Seamless Steel Tube Industry in America

SEAMLESS AND ELECTRIC-RESISTANCE WELDED STEEL TUBING • FABRICATING • FORGING

SALES OFFICES: Birmingham • Charlotte • Chicago (Oak Park) Cleveland • Dayton • Denver • Detroit (Ferndale) • Houston Los Angeles (Beverly Hills) • Moline • New York • North Kansas City • Philadelphia (Wynnewood) • Pittsburgh • Richmond Rochester • St. Louis • St. Paul • St. Petersburg • Salt Lake City Seattle • Tulsa • Wichita

CANADA: Railway & Power Engr. Corp., Ltd.

EXPORT: COPPERWELD STEEL INTERNATIONAL COMPANY, 225 Broadway, New York 7, New York

The Iron Age Summary

Mills Step Up Production Pace

After dipping to holiday low of 78.5 pct, operations are scheduled at 80.5 pct.

Moderate pace over balance of year could easily outdistance '56, threaten '55 record.

■ Steel mills are expected to step up their operations slightly this week. Production is estimated at approximately 80.5 pct of capacity following last week's holiday low of 78.5 pct.

If this is an indication of the operating pace mills will follow over balance of the month, overall output may well balance out at around 80 pct. This is somewhat better than had been looked for earlier in the year.

1957 Versus 1956—Steel production for the year could easily outdistance the 115 million tons turned out in 1956. During the first six months of '57, production approximated 60 million tons. This was some 2.6 million tons less than in the same period last year. But the strike in July-August last year cost some 11 million ingot tons of production. Thus even a moderate production pace during the last six months could establish 1957 as the second-best year in steel history. And a strong upturn could threaten the record 117 million tons produced in 1955.

The mills' announced average increase of $6 per ton is borne out by the IRON AGE's revised Finished Steel Composite price. The new IRON AGE Composite base price figures out to $119.34 per ton, compared with the previous $113.40. This represents an increase of $5.94 per ton.

August Upturn Expected — Meanwhile, the mills are still counting on August for the first signs of a definite upturn in demand for sheet, strip, bars, and the other so-called "easy" products. They figure the auto companies will be coming through with heavier tonnage orders. Also, they expect other flat-rolled users to step up their orders after vacations.

In fact, some purchasing agents are beginning to feel a bit shaky about their inventories. While the comment is not general, some buyers are wondering whether a sudden upturn in last half will catch them off guard. In the past, sudden shifts in inventory policy have snowballed to the point where the scramble for steel has created artificial shortages.

Auto Outlook—The auto companies already have put through token orders for new model production tryouts. Some mills report automotive orders for August delivery are encouraging. A further pickup is expected for September.

Demand for heavier steel products—structurals, plate, and oil country goods—continues strong. Construction, shipbuilding, freight car building, and oil and gas activity are expected to buttress the market until other industries spark an expected last-half upsurge.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,061	2,009	2,266	38.1
Ingot Index				
(1947-1949=100)	128.3	125.1	141.0	23.7
Operating Rates				
Chicago	84.0	84.0*	86.0	6.0
Pittsburgh	89.0	85.0*	88.5	6.0
Philadelphia	87.0	99.0*	101.0	0.0
Valley	71.0	61.0*	73.0	13.0
West	105.5	104.8	103.0	26.0
Buffalo	88.0	89.0	102.0	0.0
Cleveland	81.0	80.0*	89.0	0.0
Detroit	90.0	98.0	100.0	25.0
S. Ohio River	73.0	76.0*	89.0	63.0
South	93.0	93.0	93.0	3.5
Upper Ohio R.	82.0	73.5*	84.5	58.0
St. Louis	80.0	80.0	84.0	95.0
Northeast	50.0	66.5	66.5	47.0
Aggregate	80.5	78.5*	88.5	15.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.967	5.670	5.670	5.179
Pig Iron (Gross ton)	64.76	$64.56	$64.56	$60.61
Scrap, No. 1 hvy (Gross ton)	$54.50	$54.50	$54.83	$44.83
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	25.90
Copper, electrolytic	29.25	29.25	32.00	46.00
Lead, St. Louis	13.80	13.80	13.80	15.80
Magnesium ingot	36.00	36.00	36.00	34.50
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin, Straits, N. Y.	97.375	97.375	98.375	96.25
Zinc, E. St. Louis	10.00	10.50	11.50	13.50

*Revised

New Look in Industrial Trucks

Many builders have backlogs, but field is becoming more competitive.

Number of new models offered gives purchaser a wide choice for his particular needs.

▪ If you're going into the market for an industrial truck you're probably going to have to go to the end of a short waiting line. And you are going to have to pay more.

But chances are the line will move faster than it did a year ago. You'll be able to pick from a more extensive line of better equipment.

Although there are some notable exceptions, industrial truck makers generally report 1957 orders are off slightly from last year's pace. But most are still satisfied. Production and shipment statistics threaten to go right through the roof. Almost everyone is still able to report backlogs of a few weeks to 5 months.

Special Jobs in Demand—Most of the carryover business is concentrated in the field of special equipment. This is growing. One sales manager says almost half the orders received these days require special engineering. For these orders, backlogs vary from an additional 30 days for simple attachments to 9 months longer for ground-up jobs.

The buyer will get help here, too. More truck makers are starting to do a greater percentage of their own special engineering, cutting costs and lead times.

Market Picture—Here's what the situation looks like for standard models. The market is about the same for smaller and medium sized electric and petroleum powered rider units. For the most popular sizes, from 2000 lbs to 4000 lbs capacity, you'll have to wait two weeks to 30 days.

Heavier rider models, 30,000 lbs to 40,000 lbs capacity, can be delivered in 60 to 90 days.

Motorized hand trucks have more variations, usually have longer lead times. Most manufacturers say you'll have to wait two to six weeks.

If all you want is a hand powered truck, you can take it home with you.

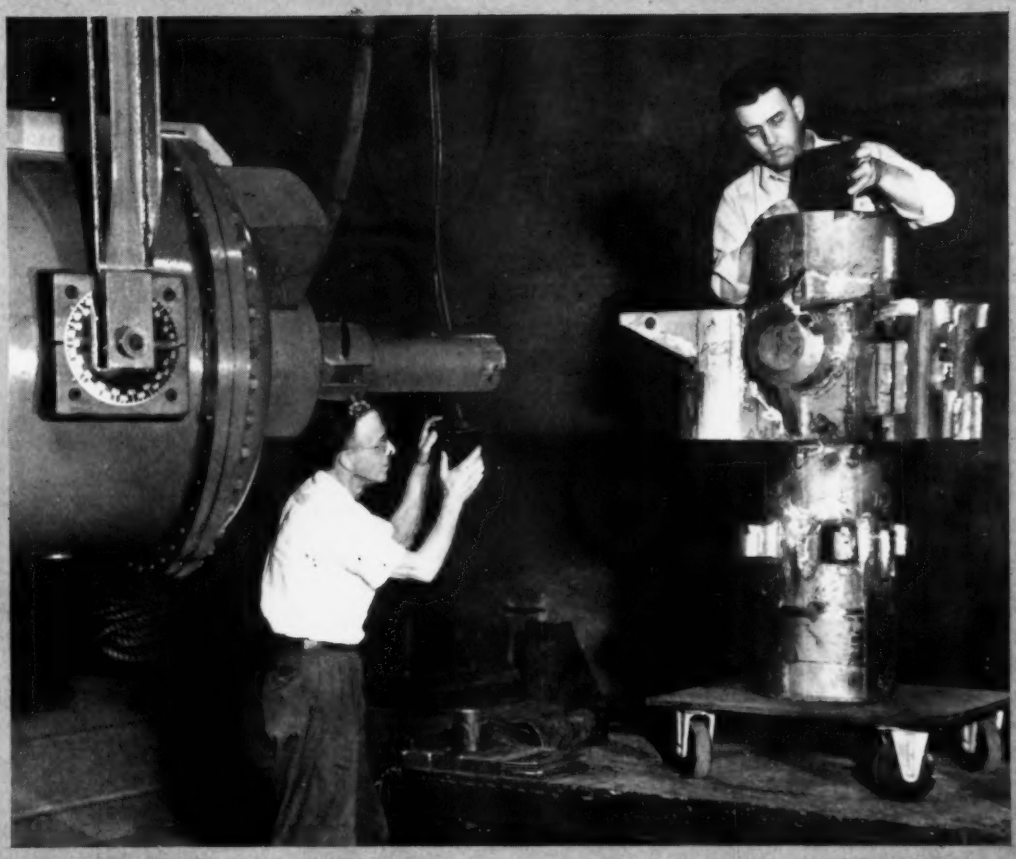
Versatile Field—Industrial truck manufacturing is a more competitive field than it has ever been. All companies maintain extensive engineering and designing staffs. One major maker says he designs standard models three years ahead, but is constantly on the lookout for new applications for which an industrial truck can be designed.

Another company says it has put out more new models thus far in 1957 than any comparable period in its history.

Market Outlook—Manufacturers report they expect a summer slump, followed by what might easily prove to be one of the biggest last quarters in the history of the industry. But they are ready for it with an extensive round of expansion. Just about all of the major companies in the field are in the process, have just completed, or are planning expansions.

A partial list includes: Yale & Towne—two new plants, San Leandro, Calif., already in operation making Y & T's full line, and a hand truck and hoisting equipment plant at Forest City, Ark., expected to open this summer; Automatic Transportation Co.—moving into 60,000 sq ft of additional floor space during the normal shutdown vacation period this summer; Lewis-Shepard Products, Inc. — moving into a new plant during the first two weeks of August.

GIVING A LIFT: Makers of industrial trucks like this Yale & Towne model are developing more new models and aiming at many new applications.



Watchdog on mounting costs

PRICES of common materials keep going up. Many new alloys are costly. Hence, rough castings become more expensive.

Even more, the cost of machining time keeps mounting. No one can afford to have it wasted by waiting for the tool to locate a void or defect.

So now is a good time to re-examine the importance of radiography. To suppliers it gives the assurance that only a quality product is delivered. To processors it gives the confidence that man and machine time will be productive—not wasted.

Today, million-volt x-ray equipment radiographs heavier parts with shorter exposures. The use of radioactive isotopes makes possible a radiographic department at moderate cost. And the new Kodak Industrial X-ray Film Type AA—with up to twice the speed of the previous film—widens the scope of all radiographic equipment.

If you would like to know how radiography can save you money—how it can keep the quality of castings high—have a serious talk with your Kodak x-ray dealer or Kodak technical representative.

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, N. Y.

Kodak
TRADE MARK

Steel Price Hike Effects Spread

Higher warehouse charges, increases in the cost of bolts, nuts, screws, and rivets are the latest entries.

Changes in finished steel product prices lift IRON AGE Composite to 5.967¢ per lb.

■ The wave of steel product price increases which came after July 1 found virtually all suppliers going along with the $6 a ton advance. (See pages 155 to 168 for new prices.) As a result the IRON AGE Finished Steel Composite base price rose from 5.670¢ to 5.967¢ per lb.

There were a few instances, however, where mills and distributors seemed anxious to tread water. Among major plate producers on the East Coast, for example, three mills advanced carbon steel plate. Two others did not, although one of these did raise the price of alloy plate.

And while warehouse prices are up in some areas in a range of $8 to $9 per ton, some Midwestern outlets are concerned. Apparently a segment of the smaller distributors feel the $6 mill boost was enough to pass on to customers. However, that wouldn't include a normal warehouse markup which the larger suppliers added. As a result there's word that price cutting in the slow items like sheet is a possibility.

Bolts, Screws Advance — New prices on bolts, nuts, rivets, and screws, effective July 8, have been announced by Lamson and Sessions Co., Cleveland. (See page 168.) The increases, representing an overall advance of 6 pct, are due to increased raw material and labor costs, the company states. Because of the grades and types of steel it uses, Lamson and Sessions indicates the steel price rise means a raw material cost increase to them of not $6, but $8 a ton. Other fastener companies are expected to follow with price increases.

One pig iron producer, U. S. Pipe and Foundry Co., Birmingham, Ala., advanced, effective July 8, basic pig iron $3.50 a ton to $62, foundry pig iron $3.50 a ton to $62.50; and malleable pig iron $3.50 a ton to $66.50. Changes by other pig iron producers are likely.

Sheet and Strip—Although some mills are sold out on July hot-and cold-rolled sheet, customers are still often able to get delivery on these items. Producers continue using delivery as a sales lure, trying to keep customers interested by getting orders out as soon as possible.

Some strip mills in the **Chicago** area are holding off on booking any light plate orders beyond early August in hope of an auto pickup in sheet-strip buying. However, as yet there's little automotive ordering. Hot rolled sheet in that market can sometimes be obtained in as little as two weeks. Strip is running three to four weeks, largely because mills are rolling plate on strip facilities.

One **Philadelphia** area producer reports some sheet buying by the automotive market for August delivery. The same mill says August business is shaping up better than had been expected. July ordering is slow. Mills can still use hot-rolled sheet and strip orders.

Sheet and strip market at **Detroit** is described as "very slow."

Plates and Shapes — Market strong, although demand is showing a few temporary effects of warm weather slowdown.

Both plate and structurals continue as quota items through the third quarter at **Chicago.** Mills have carryovers of from 2 to 6 weeks. Carbuilders in that market buying strip mill plate for car parts are concerned about possibility mills might not supply that item in the fourth quarter.

Philadelphia area producer of heavy plate reports seasonal slowdown has had some minor effect on the market. Another plate mill says customers, especially warehouses, are becoming a little more cautious in their buying. Plate ⅜ in. or thicker is more welcome with the buyers than the lighter stuff.

Heavy plate and structural market is holding up well at **Detroit.**

West Coast mills have a six week backlogs on structurals. Shipments from the East are helping ease buying demand and giving fabricators a chance to buy a wider range of products.

Electrical Alloy Increases—Allegheny Ludlum Steel Corp. announced, effective July 10, an increase in the base price of its specialty electrical steel grades. Electrical alloy grades and electrical alloy steel grades advanced 4 pct, electrical relay grades went up ½ to ¾ cents a lb. Extras on these electrical specialty grades were also increased.

PURCHASING AGENT'S CHECKLIST

Higher wages will hit all metalworking industry prices. **P. 59**

Liquid propane tank makers see hope in new markets. **P. 62**

Adhesives makers aim at new metal-on-metal applications. **P. 63**

Zinc and lead industries will go it alone. **P. 64**

COMPARISON OF PRICES

(Effective July 9, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	July 9 1957	June 30 1957	June 11 1957	July 10 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.925¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	6.05	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.60	6.30	6.30	5.85
Hot-rolled strip	4.925	4.675	4.675	4.325
Cold-rolled strip	7.17	6.870	6.870	6.28
Plate	5.12	4.87	4.87	4.52
Plates, wrought iron	13.15	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	52.00	50.00	50.00	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.30	$10.30	$10.30	$9.85
Tin plates, electro (0.50 lb.)	9.00	9.00	9.00	8.55
Special coated mfg. ternes	9.55	9.55	9.55	9.10
Bars and Shapes: (per pound)				
Merchant bars	5.425¢	5.075¢	5.075¢	4.65¢
Cold finished bars	7.30	6.85	6.85	5.90
Alloy bars	6.475	6.125	6.125	5.65
Structural shapes	5.275	5.00	5.00	4.60
Stainless bars (No. 302)	45.00	43.25	43.25	38.25
Wrought iron bars	14.45	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.65¢	7.20¢	7.20¢	6.60¢
Rails: (per 100 lb.)				
Heavy rails	5.525¢	$5.275	$5.275	$4.725
Light rails	6.50	6.25	6.25	5.65
Semifinished Steel: (per net ton)				
Rerolling billets	$77.50	$74.00	$74.00	$68.50
Slabs, rerolling	77.50	74.00	74.00	68.50
Forging billets	96.00	91.50	91.50	84.50
Alloy blooms, billets, slabs	114.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	6.15¢	5.80¢	5.80¢	5.025¢
Skelp	4.875	4.625	4.625	4.225
Finished Steel Composite: (per pound)				
Base price	5.967¢	5.670¢	5.670¢	5.179¢

	July 9 1957	June 30 1957	June 11 1957	July 10 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$68.88	$68.88	$68.88	$65.26
Foundry, Valley	65.00	65.00	65.00	60.50
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	60.17	59.00	59.00	57.67
Foundry, Chicago	65.00	65.00	65.00	60.50
Basic, del'd Philadelphia	68.38	68.38	68.38	64.48
Basic, Valley furnace	64.50	64.50	64.50	60.00
Malleable, Chicago	65.00	65.00	65.00	60.50
Malleable, Valley	65.00	65.00	65.00	60.50
Ferromanganese, cents per lb‡ 74 to 76 pct Mn base.	12.75¢	12.75¢	12.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$64.76	$64.56	$64.56	$60.61
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$56.50	$56.50	$56.50	$44.50
No. 1 steel, Phila. area	55.50	55.50	56.50	46.50
No. 1 steel, Chicago	51.50	51.50	51.50	43.50
No. 1 bundles, Detroit	47.50	47.50	46.50	39.50
Low phos., Youngstown	57.50	56.50	56.50	50.00
No. 1 mach'y cast, Pittsburgh	58.50	57.50	56.50	54.50
No. 1 mach'y cast, Philadel'a	56.50	56.50	56.50	54.50
No. 1 mach'y cast, Chicago	50.50	50.50	54.50	47.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	$54.50	$54.50	$54.83	$44.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	29.25	29.25	32.00	46.00
Copper, Lake, Conn.	29.25	29.25	32.00	46.00
Pig iron	$64.76	$64.56	$64.56	$60.61
Zinc, East St. Louis	10.50	10.50	11.00	13.50
Lead, St. Louis	13.80	13.80	13.80	15.80
Aluminum, virgin ingot	27.10	27.10	27.10	25.90
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	34.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

←To identify producer see Key on P. 166→

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	66.50	67.00	67.50	68.00	.....
Birmingham *R3*	58.50	59.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	64.50	65.00	65.50	66.00	.....
Buffalo *H1*	64.50	65.00	65.50	66.00	.....
Buffalo *W6*	64.50	65.00	65.50	66.00	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	64.50	65.00	65.00	65.50	.....
Cleveland *A5*	64.50	65.00	65.00	65.50	69.50†
Cleveland *R3*	64.50	65.00	65.00	65.50	.....
Duluth *I6*	64.50	65.00	65.00	65.50	69.50†
Erie *I4*	64.50	65.00	65.00	65.50	69.50†
Everett *M6*	66.50	67.00	67.50	.....	.....
Fontana *K1*	72.50	73.00	.....	.....	.....
Geneva, Utah *C7*	64.50	65.00	.....	.....	.....
Granite City *G2*	66.40	66.90	67.40	.....	.....
Hubbard *Y1*	.....	.....	65.00	.....	.....
Ironton, Utah *C7*	64.50	65.00	.....	.....	.....
Midland *C11*	64.50	.....	.....	.....	.....
Minnequa *C6*	64.50	65.00	65.50	.....	.....
Monessen *P6*	64.50	.....	.....	.....	.....
Neville Is. *P4*	64.50	65.00	65.00	65.50	69.50†
N. Tonawanda *T1*	.....	65.00	65.50	66.00	.....
Sharpsville *S3*	64.50	65.00	65.00	65.50	.....
So. Chicago *R3*	64.50	65.00	65.00	.....	.....
Swedeland *A2*	66.50	67.00	67.50	68.00	.....
Toledo *I4*	64.50	65.00	65.00	65.50	.....
Troy, N. Y. *R3*	66.50	67.00	67.50	68.00	72.50
Youngstown *Y1*	.....	.....	65.00	65.50	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31-0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, **$78.50; Jackson,** *J1, I4* **(Globe Div.), $77.25; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery 6 pct to 14 pct.**

STAINLESS STEEL

Base price cents per lb f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	—	27.00	39.75	32.25	37.00	—	16.75	—	17.00
Slabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	—	21.50	—	21.75
Billets, forging	—	36.50	—	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55.50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	—	50.75	76.75	59.75	69.75	40.25	35.00	—	36.00
Sheets	48.50	49.25	51.25	52.00	—	55.50	81.50	65.50	79.25	—	40.25	—	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	—	55.50	81.50	65.50	79.25	48.25	40.25	—	40.75
Wire CF; Rod HR	—	40.75	42.00	42.75	45.75	45.50	69.50	52.50	61.50	36.00	32.25	32.75	32.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Canton-Massillon, O., *R3;* Harrison, N. J., *D5;* Youngstown, *C5,* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1;* New Bedford, Mass. (.25¢ per lb higher), *R6;* Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa. *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R3;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Philadelphia, *D5;* Detroit, *R5;* Gary *U1.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Philadelphia, *D5;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forgings billets: Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse *C11;* Detroit *R5;* Munhall, Pa., S. Chicago, *U1.*

Market Relaxes In Summer Lull

Mills are trying with only moderate success to bring prices down further.

Dealers don't scare easily. Feeling is that inventory will be worth more later.

▪ A feeling of summer doldrums extends through the scrap market. Prices are off slightly, activity is at a low point and no major buys are in the wind.

But while inactivity characterizes most markets, there is a feeling of underlying strength and no major slump is looked for in any area. Mills are putting on some pressure for lower prices, and with some success here and there. On the other hand, many dealers believe that inventory is going to be worth more in late August. They are not being rushed into sales.

Export continues brisk in coastal areas. This bolsters the market where a somewhat weaker domestic market otherwise might result in slightly lower prices.

Synthetic Scrap—U. S. Steel is considering the production of synthetic scrap in bessemer converters. It has already made some in Youngstown and Chicago. The method differs from duplex in that ingots rather than hot metal are produced. The product is equal to forge crops or other types of good scrap.

Future scrap prices will determine how much the process is used. But it could mean a significant reduction in scrap consumption.

Pittsburgh—Prices of secondary grades are off $1 to $2. No. 1 grades are unchanged. Price activity came after a lack of mill buying had stirred reports of a general weakness. The market is easier but dealers are still showing resistance to reduced price levels.

Chicago—Despite a level of mill buying that is conspicious by its absence, there is no slippng of scrap levels. After dropping for two weeks, the market held firm. Chief factors at the moment appear to be a low stock level in dealer yards, a number of orders written two to three weeks ago which are still being covered, and a feeling that a strengthening market in August will make inventories worth holding. Dealer-broker prices continue strong, although dealer prices to collectors have slipped somewhat.

Philadelphia — Price of No. 2 bundles dropped $3, restoring a conventional relationship with No. 2 heavy melting. Domestic activity was quiet, with neither dealers nor consumers applying pressure to brokers. Export continues active, with three cargoes to be filled this month.

New York—Blast furnace grades are off $1 in an otherwise quiet market. Export is holding up the price of steelmaking grades. Little activity is expected here until after the vacation periods are over.

Birmingham — With the largest consumer holding up shipments and again out of the market, the openhearth market has an appearance of weakness. Other grades are moving fairly well, with the exception of structurals and plate, which seem stagnant. Dealers seem to feel a weakness and want to sell what they have, but are reluctant to take orders for more than their stocks because of a slow intake.

Cincinnati — Prices are unchanged here. Scrap is moving well at going prices, but there is no over supply and broker attempts to buy at reduced figures have failed to bring in any sales.

St. Louis — The stability of this market continues and prices are unchanged. Movement is only fair as a result of the heat, the holiday and poor condition of roads due to heavy rains, which makes collection of scrap difficult.

Detroit—The market here is in a state of confusion. Dealers have yet to make a sale since the closing of industrial lists a week ago. They say mills are talking of resistance to raising prices above June levels. In spite of this, the market appears strong.

Cleveland — Prices of openhearth grades are off $2 in this market and the Valley. Drop is caused by a lack of mill orders and feeling that large buys are not likely in the near future. Cut structurals and foundry grades are still strong and cast grades are holding firm.

Buffalo—Mills have not come into the market for monthly purchases as yet. Absence of activity leaves prices unchanged in the static market.

Boston—The market is on the uncertain side following the holiday weekend. There is little activity currently and demand is weak, bringing prices down $2 for No. 1 grades.

West Coast—Flow of scrap in this area is very slow. Mills continue to eat into inventories rather than buy at today's prices. The only purchases have been in some secondary grades. Export is quiet.

Engineered to cut your scrap handling costs

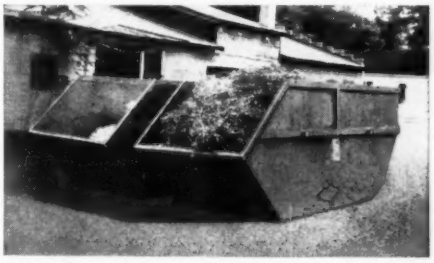
. . . The LOAD LUGGER System

Scrap is automatically classified for you by your customers when you serve them with The Load Lugger System of detachable steel containers handled by a Load Lugger equipped truck. This enables you to pay higher scrap prices, putting you in a more advantageous competitive position.

The Load Lugger System further reduces costs by eliminating expensive crane pick-ups. One Load Lugger equipped truck, operated by one man, the driver, can render fast, efficient service to a large number of customers.

The use of Load Lugger containers keeps customers' premises free of unsightly, hazardous scrap piles — a fact which your customers will appreciate and which further cements customer relations and opens doors to more business for you.

BEFORE: Turnings overflow fifty-gallon steel drums, make handling slow and costly.



AFTER: Scrap stored in Load Lugger containers keeps customer premises neat, reduces collection costs.

LOAD LUGGER

Well known by scores of users, the many Load Lugger advantages will interest you. It will pay you to get in touch with us today.

LOAD LUGGER B-W BORG-WARNER

LOAD LUGGER, Ingersoll KALAMAZOO DIVISION
BORG-WARNER CORPORATION
1857 North Pitcher Street, Kalamazoo, Michigan, Telephone FIreside 5-3501
EXPORT SALES: BORG-WARNER INTERNATIONAL CORPORATION, CHICAGO

SCRAP PRICES *(Effective July 9, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$56.00 to $57.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 dealer bundles	56.00 to 57.00
No. 1 factory bundles	62.00 to 63.00
No. 2 bundles	46.00 to 47.00
No. 1 busheling	56.00 to 57.00
Machine shop turn.	33.00 to 34.00
Mixed bor. and ms. turn.	33.00 to 34.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	37.00 to 38.00
Low phos. punch'gs plate	62.00 to 63.00
Heavy turnings	50.00 to 51.00
No. 1 RR. hvy. melting	63.00 to 64.00
Scrap rails, random lgth.	67.00 to 68.00
Rails 2 ft and under	70.00 to 71.00
RR. steel wheels	69.00 to 70.00
RR. spring steel	69.00 to 70.00
RR. couplers and knuckles	69.00 to 70.00
No. 1 machinery cast.	58.00 to 59.00
Cupola cast.	49.00 to 50.00
Heavy breakable cast.	47.00 to 48.00

Chicago

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 dealer bundles	52.00 to 53.00
No. 1 factory bundles	57.00 to 58.00
No. 2 bundles	41.00 to 42.00
No. 1 busheling	51.00 to 52.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	34.00 to 35.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Low phos. forge crops	60.00 to 61.00
Low phos. punch'gs plate	56.00 to 57.00
Low phos. 3 ft and under	54.00 to 55.00
No. 1 RR. hvy. melting	57.00 to 59.00
Scrap rails, random lgth.	70.00 to 71.00
Rerolling rails	76.00 to 77.00
Rails 2 ft and under	75.00 to 76.00
Locomotive tires cut	62.00 to 63.00
Cut bolsters & side frames	63.00 to 64.00
Angles and splice bars	66.00 to 67.00
RR. steel car axles	82.00 to 83.00
RR. couplers and knuckles	60.00 to 61.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast.	47.00 to 48.00
Heavy breakable cast.	44.00 to 45.00
Cast iron brake shoe	46.00 to 47.00
Cast iron wheels	53.00 to 54.00
Malleable	61.00 to 62.00
Stove plate	46.00 to 47.00
Steel car wheels	62.00 to 63.00

Philadelphia Area

No. 1 hvy. melting	$55.00 to $56.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 dealer bundles	55.00 to 56.00
No. 2 bundles	46.00 to 47.00
No. 1 busheling	55.00 to 56.00
Machine shop turn.	38.00 to 39.00
Mixed bor. short turn.	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Shoveling turnings	41.00 to 42.00
Clean cast chem. borings	45.00 to 46.00
Low phos. 5 ft and under	59.00 to 60.00
Low phos. 2 ft and under	60.00 to 61.00
Low phos. punch'gs	60.00 to 61.00
Elec. furnace bundles	58.00 to 59.00
Heavy turnings	51.00 to 52.00
RR. steel wheels	65.00 to 66.00
RR. spring steel	65.00 to 66.00
Rails 18 in. and under	71.00 to 72.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	54.00 to 55.00
Cast iron car wheels	59.00 to 60.00
Malleable	61.00 to 62.00
Unstripped motor blocks	43.00 to 44.00
No. 1 machinery cast.	56.00 to 57.00

Cleveland

No. 1 hvy. melting	$49.00 to $50.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 dealer bundles	49.00 to 50.00
No. 1 factory bundles	54.00 to 55.00
No. 2 bundles	39.00 to 40.00
No. 1 busheling	49.00 to 50.00
Machine shop turn.	22.00 to 23.00
Mixed bor. and turn.	26.00 to 27.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	26.00 to 27.00
Cut struct'r'l & plates, 2 ft & under	58.00 to 59.00
Drop forge flashings	49.00 to 50.00
Low phos. punch'gs, plate	51.00 to 52.00
Foundry steel, 2 ft & under	52.00 to 53.00
No. 1 RR. heavy melting	57.00 to 58.00
Rails 2 ft and under	72.00 to 73.00
Rails 18 in. and under	73.00 to 74.00
Railroad grate bars	35.00 to 36.00
Steel axle turnings	33.00 to 34.00
Railroad cast.	56.00 to 57.00
No. 1 machinery cast.	55.00 to 56.00
Stove plate	49.00 to 50.00
Malleable	62.00 to 63.00

Youngstown

No. 1 hvy. melting	$52.00 to $53.00
No. 2 hvy. melting	47.00 to 48.00
No. 1 dealer bundles	52.00 to 53.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	24.00 to 25.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	27.00 to 28.00
Low phos. plate	54.00 to 55.00

Buffalo

No. 1 hvy. melting	$45.00 to $46.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 busheling	45.00 to 46.00
No. 1 dealer bundles	45.00 to 46.00
No. 2 bundles	35.00 to 36.00
Machine shop turn.	28.00 to 29.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	31.00 to 32.00
Low phos. plate	49.00 to 50.00
Scrap rails, random lgth.	56.00 to 57.00
Rails 2 ft and under	66.00 to 67.00
RR. steel wheels	53.00 to 54.00
RR. spring steel	49.00 to 50.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	50.00 to 51.00
No. 1 cupola cast.	45.00 to 46.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$47.00 to $48.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	35.00 to 36.00
No. 1 busheling	47.00 to 48.00
Drop forge flashings	47.00 to 48.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. punch'gs plate	47.00 to 48.00
No. 1 cupola cast.	48.00 to 49.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast.	54.00 to 55.00

St. Louis

No. 1 hvy. melting	$45.50 to $46.50
No. 2 hvy. melting	43.00 to 44.00
No. 1 dealer bundles	47.00 to 48.00
No. 2 bundles	38.00 to 39.00
Machine hop turn.	30.00 to 31.00
Cast iron borings	31.00 to 32.00
Shoveling turnings	31.00 to 32.00
No. 1 RR. hvy. melting	55.50 to 56.50
Rails, random lengths	66.00 to 67.00
Rails 18 in. and under	73.00 to 74.00
Locomotive tires uncut	59.00 to 60.00
Angles and splice bars	62.00 to 63.00
Std. steel car axles	72.00 to 73.00
RR. Specialties	61.00 to 62.00
Cupola cast.	45.00 to 46.00
Heavy breakable cast.	41.00 to 42.00
Cast iron brake shoes	43.00 to 44.00
Stove plate	43.50 to 44.50
Cast iron car wheels	49.00 to 50.00
Rerolling rails	71.00 to 72.00
Unstripped motor blocks	40.00 to 41.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	43.00 to 44.00
No. 2 bundles	35.00 to 36.00
No. 1 busheling	43.00 to 44.00
Elec. furnace, 3 ft & under	47.00 to 48.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and short turn.	29.00 to 30.00
Shoveling turnings	29.00 to 30.00
Clean cast. chem. borings	32.00 to 33.00
No. 1 machinery cast.	42.00 to 43.00
Mixed cupola cast.	34.00 to 35.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	32.00 to 33.00
Unstripped motor blocks	31.00 to 32.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	41.00 to 42.00
No. 2 dealer bundles	40.00 to 41.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	28.00 to 29.00
Shoveling turnings	29.00 to 30.00
Clean cast. chem. borings	34.00 to 35.00
No. 1 machinery cast.	46.00 to 47.00
Mixed yard cast.	41.00 to 42.00
Charging box cast.	46.00 to 47.00
Heavy breakable cast.	46.00 to 47.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	$49.00 to $50.00
No. 2 hvy. melting	39.00 to 40.00
No. 1 dealer bundles	49.00 to 50.00
No. 2 bundles	37.00 to 38.00
No. 1 busheling	49.00 to 50.00
Machine shop turn.	35.00 to 36.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	28.00 to 29.00
Electric furnace bundles	50.00 to 51.00
Elec. furnace, 3 ft & under	47.00 to 48.00
Bar crops and plate	54.00 to 55.00
Structural and plate, 2 ft	54.00 to 55.00
No. 1 RR. hvy. melting	53.00 to 54.00
Scrap rails, random lgth.	59.00 to 60.00
Rails, 18 in. and under	65.00 to 66.00
Angles & splice bars	59.00 to 60.00
Rerolling rails	67.00 to 68.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Charging box cast.	34.00 to 35.00
Cast iron car wheels	46.00 to 47.00
Unstripped motor blocks	44.00 to 45.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$51.00 to $52.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 dealer bundles	51.00 to 52.00
No. 2 bundles	42.00 to 43.00
Machine shop turn.	32.00 to 33.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	35.00 to 36.00
Cast iron borings	30.00 to 31.00
Low phos. 18 in. & under	54.00 to 55.00
Rails, random lengths	62.00 to 63.00
Rails, 18 in. and under	70.00 to 71.00
No. 1 cupola cast.	45.00 to 46.00
Hvy. breakable cast.	43.00 to 44.00
Drop broken cast.	55.00 to 56.00

San Francisco

No. 1 hvy. melting	$48.00
No. 2 hvy. melting	46.00
No. 1 dealer bundles	47.00
No. 2 bundles	35.00
Machine shop turn.	32.00
Cast iron borings	32.00
No. 1 RR. hvy. melting	48.00
No. 1 cupola cast.	53.00

Los Angeles

No. 1 hvy. melting	$46.00
No. 2 hvy. melting	43.00
No. 1 dealer bundles	45.00
No. 2 bundles	38.00
Machine shop turn.	32.00
Shoveling turnings	34.00
Cast iron borings	31.00
Elec. furn. 1 ft and under (foundry)	57.00
No. 1 RR. hvy. melting	46.00
No. 1 cupola cast.	54.00

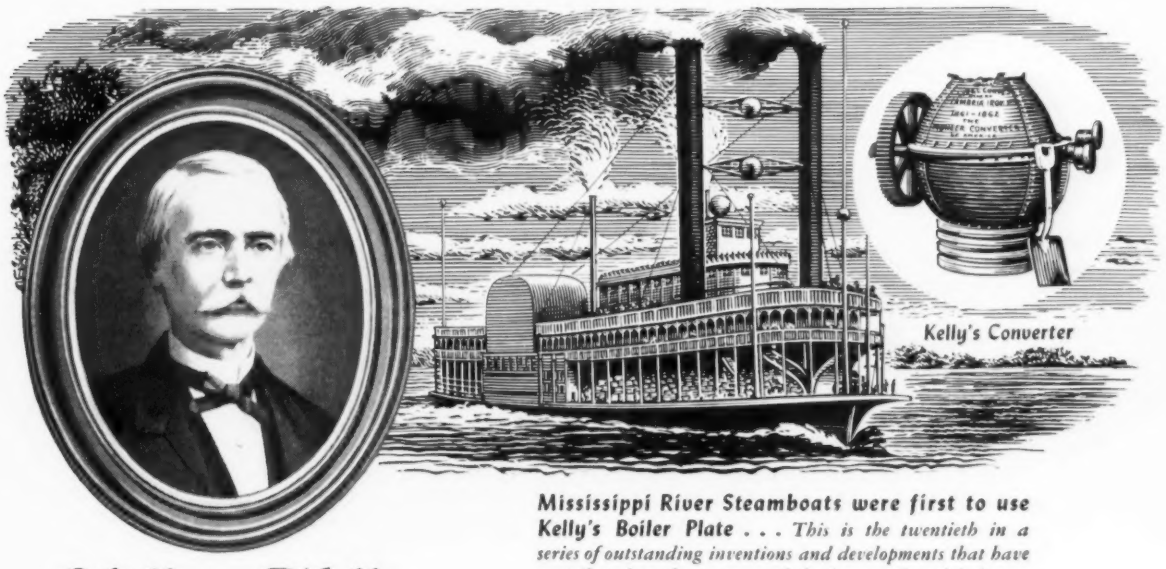
Seattle

No. 1 hvy. melting	$46.00
No. 2 hvy. melting	42.00
No. 2 bundles	$28.00 to 30.00
No. 1 cupola cast.	47.00
Mixed yard cast.	47.00

Hamilton, Ont.

No. 1 hvy. melting	$45.00
No. 2 hvy. melting	40.00
No. 1 dealer bundles	45.00
No. 2 bundles	34.00
Mixed steel scrap	42.00
Busheling	36.00
Bush., new fact., prep'd	45.00
Bush., new fact., unprep'd	39.00
Machine shop turn.	22.00
Short steel turn.	30.00
Mixed bor. and turn.	24.00
Rails, rerolling	56.00
Cast scrap	52.00

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING



William Kelly

Mississippi River Steamboats were first to use Kelly's Boiler Plate . . . *This is the twentieth in a series of outstanding inventions and developments that have contributed to the progress of the iron and steel industry.*

1847...The First Converter

They called him the "Crazy Irishman" because he tried to blow cold air on molten iron and convert it into steel. In 1847 – nine years before Bessemer, Kelly completed his first converter. It was a failure, but Kelly had tenacity.

By 1851, Kelly's converters were producing blooms of "high repute", rather than steel. His boiler plate, however, was used by steamboats on the Ohio and Mississippi years before similar iron was used for boiler plate in England. But Kelly was not satisfied to just produce hard-to-work "run-out" iron. Kelly's sights were set on producing a malleable iron. Disappointment followed disappointment. The converters would work one day . . . fizzle out the next.

Time was running out on William Kelly, but not destiny. Twenty years after his original experiments, an American company, with the aid of the Mushet process, finally succeeded in producing the first truly commercial "Kelly" steel – far superior to any previously made of iron.

Our personnel, equipment, experience and strategically located offices will prove extremely valuable in supplying you with scrap of known analysis to produce the special steels you require. We welcome your inquiry.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Markets Are Dull For All Metals

Prices and market conditions hold as markets are slow to get back to business.

Almost no sales reported in zinc, and only small tonnages of tin change hands.

One source reports major lead sale for shipment this month.

■ Activity in major nonferrous markets was relatively dull this week following the holiday letdown.

Here's how the situation looks, metal-by-metal:

Aluminum

The Aluminum Assn. reports shipments of sheet and plate for May were up over April. A substantial gain by non-heat-treatable items was the major factor as heat-treatable sheet and plate actually lost a little ground.

Shipments of foil were also off slightly. The totals for May 1957, the previous month, and the first five months of the year:

Sheet and Plate

Non-heat-treatable

May, 1957—102,817,000 lb

April, 1957—94,131,000

First 5 months—441,907,000

Heat-treatable

May, 1957—24,082,000 lb

April, 1957—24,578,000

First 5 months—124,714,000

Foil

May, 1957—13,845,888 lb

April, 1957—14,501,076

First 5 months—72,752,370

Aluminum Co. of America is preparing to throw the switch on an aluminum rolling mill at Davenport, Ia., which will be among the largest in the world in terms of the size of the product it will turn out.

Among the equipment, for which Alcoa spent about $50 million, is a 160 in. hot mill, 100 in. cold mill, a $15 million foil operation, and a new high-capacity plate stretcher.

Copper

All markets—producers, custom smelters, and scrap—remain quiet.

There has been no further word on the rumor that Chile is planning a substantial reduction in output. The Chilean government is currently negotiating for a $40 million loan from the U. S. Export-Import bank. Financial circles say this is because the drop in world copper prices is straining the Chilean budget.

The proposed cut in Chilean production was rumored to be about 10 pct. This would mean about 4000 lb per month less.

Zinc

The market was dull, with no substantial sales reported.

The Bureau of Mines reports zinc consumption in April was off about 1 pct from the previous month, 76,589 tons from 77,484 tons. Brass mills and ingot makers used about 7 pct more, rolling mills about 13 pct more. But zinc used for alloying was off about 6 pct.

The Bureau also reported that consumption of zinc for the first four months of 1957 was definitely off from the same period 1956.

Lead

Generally quiet. But a few substantial sales were reported, for shipment this month.

The Bureau of Mines says the new supply of lead made available in April 1957 was 114,800 tons, of which 93,900 tons were consumed. Primary refinery production was 49,942 tons, up 6 pct over March 1957, and the highest reported for any month since 1951. Imports were up about 8 pct over the previous month.

Tin

On the day before the July 4 holiday spot tin closed at 98.00¢ per lb. On the day after the holiday it closed at 97.75. There seems to be little doubt in the trade that the manager of the International Tin Agreement Buffer stock is buying metal. In fact, reports from London indicate that early last week a more defined premium was developing for spot tin due to fears that the buffer stock was absorbing large quantities.

Tin prices for the week: July 2—97.875; July 3—98.00; July 5—97.75; July 8—97.375; July 9—97.25.*

* Estimate

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum ingot	27.10	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	29.25	32.00	6/19/57
Copper (CS)	28.50	29.00	7/1/57
Copper (L)	29.25	32.00	6/19/57
Lead, St. L.	13.80	14.80	6/11/57
Lead, N. Y.	14.00	15.50	6/11/57
Magnesium ingot	36.00	34.09	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	74.00	64.50	12/6/56
Titanium sponge	200-250	250-275	6/6/57
Zinc, E. St. L.	10.00	10.50	7/1/57
Zinc, N. Y.	10.50	11.00	7/1/57

ALUMINUM: 99% ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 162.

3

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NONFERROUS PRICES *(Effective July 9, 1957)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1800, 1100, 3003	44.3	42.1	40.9	40.2
5052	51.8	46.8	45.1	42.9
6061-0	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.4	57.6-61.1
12-14	43.4-44.8	58.4-62.7
24-26	46.4-46.9	68.7-78.1
36-38	54.8-55.4	91.5-94.9

Screw Machine Stock—2011-T-3

Size*	¼	⅜-⅝	¾-1	1¼-1½
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.010 gage	$1.352	$1.803	$2.254	$2.704
.024 gage	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	108.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	51.38	.....	48.61	51.57
Brass, 70/30	44.69	45.23	46.63	47.60
Brass, Low	47.40	47.94	47.34	50.21
Brass, R L	48.36	48.90	48.30	51.17
Brass, Naval	48.85	.....	43.16	52.26
Muntz Metal	46.94	.....	42.75	.....
Comm. Bz.	49.86	50.40	49.80	52.42
Mang. Bz.	52.29	.....	46.69	.....
Phos. Bz. 5%	70.47	.....	70.97	.....

Free Cutting Brass Rod 32.87

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $9.50-$10.60; alloy, $14.75; Plate, HR, commercially pure, $8.00-$8.75; alloy, $10.75. Wire, rolled and/or drawn, commercially pure, $7.50-$8.00; alloy, $10.00; Bar, HR or forged, commercially pure, $6.15-6.40; alloy, $6.15-$6.35; billets, HR, commercially pure, $6.00-$6.25; alloy, $6.00-$6.20.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex. ... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9%, small lots ..... $ 4.55
Chromium, 99.8% metallic basis ... $ 1.31
Cobalt, 97-99% (per lb) .... $2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined 39.50-53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz... $ 2.25
Iridium, dollars per troy oz.... $90 to $100
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York ..... $255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contained nickel 71.25
Palladium, dollars per troy oz... $23 to $24
Platinum, dollars per troy oz.... $92 to $95
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 90.250
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium ..... $ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 29.50
- No. 120 ..... 28.50
- No. 123 ..... 27.00

80-10-10 ingot
- No. 305 ..... 33.50
- No. 315 ..... 31.50

88-10-2 ingot
- No. 210 ..... 41.25
- No. 215 ..... 37.50
- No. 245 ..... 33.50

Yellow ingot
- No. 405 ..... 24.00

Manganese bronze
- No. 421 ..... 27.00

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.75-25.75
- 0.60 copper max. 24.50-25.50

Piston alloys (No. 122 type) .. 23.00-25.00
No. 12 alum. (No. 2 grade) ... 21.50-23.00
108 alloy 21.75-23.00
195 alloy 24.50-26.25
13 alloy (0.60 copper max.) .. 24.50-25.50
AXS-679 ..... 21.75-23.00

Steel deoxidizing aluminum, notch bar granulated or shot

Grade 1—95-97½% 23.00-23.50
Grade 2—92-95% 21.25-22.00
Grade 3—90-92% 20.25-21.00
Grade 4—85-90% 19.00-19.75

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	25¼	24½
Yellow brass	19⅛	17⅝
Red brass	22¼	21½
Comm. bronze	23⅛	22⅜
Mang. bronze	17⅝	16⅞
Yellow brass rod ends	18⅞	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24¼—24⅜
No. 2 copper wire	22¾—22⅞
Light copper	20¼—20⅜
*Refinery brass	22
Copper bearing material	21

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	24¼—24⅜
No. 2 copper wire	22¾—22⅞
Light copper	20¼—20⅜
No. 1 composition	22½
No. 1 comp. turnings	22
Hvy. yellow brass solids	16½
Brass pipe	18½
Radiators	17½
Aluminum	
Mixed old cast	14 —14½
Mixed new clips	15½—16½
Mixed turnings, dry	14½—15½

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	21 —21½
No. 2 copper wire	19½—20
Light copper	17¾—18¼
Auto radiators (unsweated)	13½—14
No. 1 composition	18½—19
No. 1 composition turnings	18 —18½
Cocks and faucets	14½—15
Clean heavy yellow brass	12½—13
Brass pipe	15½—16
New soft brass clippings	17 —17½
No. 1 brass rod turnings	14¼—14¾

Aluminum

Alum. pistons and struts	5½— 6
Aluminum crankcases	10½—11
1100 (2S) aluminum clippings	13½—14
Old sheet and utensils	10½—11
Borings and turnings	6½— 7
Industrial castings	10½—11
2024 (24S) Clippings	12 —12½

Zinc

New zinc clippings	4 — 4½
Old zinc	3 — 3¼
Zinc routings	1¾— 2
Old die cast scrap	1½— 1¾

Nickel and Monel

Pure nickel clippings	85-90
Clean nickel turnings	70-75
Nickel anodes	85-90
Nickel rod ends	85-90
New Monel clippings	45-48
Clean Monel turnings	35-40
Old sheet Monel	44-45
Nickel silver clippings, mixed	21
Nickel silver turnings, mixed	18

Lead

Soft scrap lead	9½—10
Battery plates (dry)	4¼— 4⅛
Batteries, acid free	2¾— 3

Miscellaneous

Block tin	75 —76
No. 1 pewter	59 —60
Auto babbitt	39 —40
Mixed common babbitt	11 —11⅛
Solder joints	15½—16
Siphon tops	42
Small foundry type	13 —13¼
Monotype	13 —13¼
Lino. and stereotype	12 —12¼
Electrotype	11 —11¼
Hand picked type shells	8 — 8½
Lino. and stereo. dross	3¾— 4
Electro. dross	3 — 3¼

IRON AGE

STEEL PRICES

(Effective July 9, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$114.00 *B3*		5.325 *B3*	7.80 *B3*	5.325 *B3*						
	Buffalo, N. Y.	$77.50 *R3, B3*	$96.00 *R3, B3*	$114.00 *R3, B3*	6.225 *B3*	5.325 *B3*	7.80 *B3*	5.325 *B3*	4.925 *R3, B3*	7.15 *R7*	7.325 *B3*			
	Claymont, Del.													14.85 *C11*
	Harrison, N. J.													
	Conshohocken, Pa.		$101.00 *A2*	$121.00 *A2*					4.975 *A2*	7.20 *A2*	7.325 *A2*			
	New Bedford, Mass.									7.60 *R6*				
	Johnstown, Pa.	$77.50 *B3*	$96.00 *B3*	$114.00 *B3*		5.325 *B3*	7.80 *B3*							
	Boston, Mass.									7.70 *T8*				15.40 *T8*
	New Haven, Conn.									7.60 *R6*				
	Baltimore, Md.									7.15 *T8*				15.05 *T8*
	Phoenixville, Pa.					5.50 *P2*		5.50 *P2*						
	Sparrows Pt., Md.								4.925 *B3*		7.325 *B3*			
	Bridgeport, Wallingford, Conn.	$82.50 *N8*	$101.00 *N8*	$114.00 *N8*						7.60 *W1* 7.25 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.70 *A5* 7.90 *N7*				15.20 *T8* 15.40 *N7*
MIDDLE WEST	Alton, Ill.								4.925 *L1*					
	Ashland, Ky.								4.925 *A7*					
	Canton-Massillon, Dover, Ohio		$96.00 *R3*	$114.00 *R3, T5*						7.15 *G4*		10.40 *G4*		14.85 *C11*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$77.50 *U1, R3*	$96.00 *U1, R3,W8*	$114.00 *U1, R3,W8*	6.225 *U1*	5.275 *U1, W8,P13*	7.75 *U1, Y1* 6.525 *W8*	5.275 *U1*	4.925 *W8, N4,A1*	7.25 *A1,T8, M8*			8.10 *W8, S9,I3*	14.85 *A1, S9,* 15.05 *T8*
	Cleveland, Ohio									7.15 *A5,J3*			8.10 *J3*	
	Detroit, Mich.			$114.00 *R3*					5.025 *G3, M2*	7.25 *M2D1D2 G3,P2,P11*	7.425 *G3*	10.40 *G3, D2*	8.10 *G3*	
	Anderson, Ind.									7.15 *G4*		10.40 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$77.50 *U1*	$96.00 *U1*	$114.00 *U1, Y1*	6.225 *I3*	5.275 *U1*	7.75 *U1, I3*	5.25 *I3*	4.925 *U1, I3,Y1*	7.15 *Y1*	7.325 *U1, I3,Y1*	10.50 *Y1*	8.10 *U1, Y1*	
	Sterling, Ill.	$77.50 *N4*				5.275 *N4*			5.025 *N4*					
	Indianapolis, Ind.									7.30 *C5*				
	Newport, Ky.												8.10 *A9*	
	Middletown, Ohio									7.15 *A7*				
	Niles, Warren, Ohio Sharon, Pa.		$96.00 *S1, C10*	$114.00 *C10,S1*					4.925 *R3, S1*	7.15 *R3,T4*	7.325 *R3, S1*	10.30 *S1, R3*	8.10 *S1*	15.05 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$77.50 *U1, P6*	$96.00 *U1, C11,P6*	$114.00 *U1, C11*	6.225 *U1*	5.275 *U1, J3*	7.75 *U1, J3*	5.275 *U1*	4.925 *P6*	7.15 *J3,B4, S7*			8.10 *S9*	14.85 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.275 *W3*			4.925 *W3*	7.15 *W3,F3*	7.325 *W3*			
	Youngstown, Ohio	$77.50 *R3*	$96.00 *Y1, C10*	$114.00 *Y1*		5.425 *Y1*	7.75 *Y1*			7.15 *R3,Y1, C5*	7.325 *U1, Y1*	10.50 *Y1*	8.10 *U1, Y1*	
WEST	Fontana, Cal.	$88.00 *K1*	$105.50 *K1*	$135.00 *K1*		6.025 *K1*	8.50 *K1*	6.225 *K1*	5.775 *K1*	9.00 *K1*				
	Geneva, Utah		$96.00 *C7*			5.275 *C7*	7.75 *C7*		5.175 *S2*		7.575 *S2*			
	Kansas City, Mo.					5.375 *S2*	7.85 *S2*							
	Los Angeles, Torrance, Cal.		$105.50 *B2*	$134.00 *B2*		5.975 *C7, B2*	8.45 *B2*		5.675 *C7, B2*				9.30 *B2*	
	Minnequa, Colo.					5.575 *C6*			6.025 *C6*	9.10 *K1*				
	Portland, Ore.					6.025 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$105.50 *B2*			5.925 *B2*	8.40 *B2*		5.675 *C7, B2*					
	Seattle, Wash.		$105.50 *B2*			6.025 *B2*	8.50 *B2*		5.775 *B2*					
SOUTH	Atlanta, Ga.					5.475 *A8*			5.125 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$77.50 *T2*	$96.00 *T2*			5.275 *T2, R3*	7.75 *T2*		4.925 *T2, R3,C16* 5.225 *C10*		7.325 *T2*			
	Houston, Lone Star, Texas	$83.50 *L3*	$101.00 *S2*	$119.00 *S2*		5.375 *S2*	7.85 *S2*		5.175 *S2*		7.575 *S2*			

STEEL PRICES

(Effective July 9, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled 19 ga.		Cokes* 1.25 lb. base box	Electro* 0.25 lb. base box	Holloware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.925 *B3*	6.05 *B3*				7.275 *B3*	8.975 *B3*			6.15 *W6*	† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.975 *A2*	6.10 *A2*				7.325 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										6.15 *B3*			
	Fairless, Pa.	4.975 *U1*	6.10 *U1*				7.325 *U1*	9.025 *U1*				$10.15 *U1*	$8.85 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.925 *B3*	6.05 *B3*	6.60 *B3*			7.275 *B3*	8.975 *B3*	9.725 *B3*		6.15 *B3*			
	Worcester, Mass.										6.45 *A5*	$10.15 *B3*	$5.85 *B3*	
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.35 *L1*			
	Ashland, Ky.	4.925 *A7*		6.60 *A7*	6.625 *A7*									
	Canton-Massillon, Dover, Ohio			6.60 *R3, R1*										
	Chicago, Joliet, Ill.	4.925 *W8, A1*					7.275 *U1*				6.15 *A5, R3, W8, N4, K2*			
	Sterling, Ill.										6.25 *N4, K2*			
	Cleveland, Ohio	4.925 *R3, J3*	6.05 *R3 J3*		6.625 *R3*		7.275 *R3 J3*	8.975 *R3, J3*			6.15 *A5*			
	Detroit, Mich.	5.025 *G3, M2*	6.15 *G3* 6.05 *M2*				7.375 *G2*	9.075 *G3*						
	Newport, Ky.	4.925 *A1*	6.05 *A1*										*	
	Gary, Ind. Harbor, Indiana	4.925 *U1, I3, Y1*	6.05 *U1, I3, Y1*	6.60 *U1, I3*	6.625 *U1, I3, Y1*	7.00 *U1*	7.275 *U1, Y1, I3*	8.975 *U1, Y1*			6.15 *Y1*	$10.05 *U1, Y1*	$8.75 *I3, U1, Y1*	7.50 *U1, Y1*
	Granite City, Ill.	5.125 *G2*	6.25 *G2*	6.80 *G2*	6.825 *G2*								$8.85 *G2*	7.60 *G2*
	Kokomo, Ind.			6.70 *C9*							6.25 *C9*			
	Mansfield, Ohio		6.05 *E2*			7.00 *E2*								
	Middletown, Ohio	4.925 *A7*	6.05 *A7*	6.60 *A7*	6.625 *A7*	7.00 *A7*	7.275 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	4.925 *R3, N3, S1*	6.05 *R3*	6.60 *R3*	6.625 *N3*	7.00 *N3, S1*	7.275 *R3*	8.975 *S1, R3*					$8.75 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donora, Pa.	4.925 *U1, J3, P6*	6.05 *U1, J3, P6*	6.60 *U1, J3*	6.625 *U1*		7.275 *U1, R3, J3*	8.975 *U1, J3*	9.725 *U1*		6.15 *A5, J3, P6*	$10.05 *U1, J3*	$8.75 *U1, J3*	7.50 *U1, J3*
	Portsmouth, Ohio	4.925 *P7*	6.05 *P7*								6.15 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.925 *W3, W5*	6.05 *W3, F3, W5*	6.60 *W3, W5*		7.00 *W3, W5*		8.975 *W3*				$10.05 *W5, W3*	$8.75 *W5, W3*	7.50 *W5*
	Youngstown, Ohio	4.925 *U1, Y1*	6.05 *Y1*		6.625 *Y1*		7.275 *Y1*	8.975 *Y1*			6.15 *Y1*			
WEST	Fontana, Cal.	5.775 *K1*	7.30 *K1*									$10.80 *K1*	$9.50 *K1*	
	Geneva, Utah	5.025 *C7*												
	Kansas City, Mo.										6.40 *S2*			
	Los Angeles, Torrance, Cal.										6.95 *B2*			
	Minnequa, Colo.										6.40 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.625 *C7*	7.00 *C7*	7.35 *C7*							6.95 *C7*	$10.80 *C7*	$9.50 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.925 *T2, R3*	6.05 *T2*	6.60 *T2, R3*							6.15 *T2, R3*	$10.15 *T2*	$8.85 *T2*	
	Houston, Tex.										6.40 *S2*			

STEEL PRICES

(Effective July 9, 1957)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb. unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.475 *B3*	8.775 *B3*	7.925 *B3*					
	Buffalo, N. Y.	5.425 *R3,B3*	5.425 *R3,B3*	7.30 *R3*, 7.35 *B5*	6.475 *B3,R3*	8.775 *B3,B5*	7.925 *B3*	5.10 *B3*				7.65 *W6*
	Claymont, Del.							5.70 *P2*		7.20 *C4*	7.625 *C4*	
	Coatesville, Pa.							5.50 *L4*		7.20 *L4*	7.55 *L4*	
	Conshohocken, Pa.							5.20 *A2*	6.175 *A2*	7.20 *A2*	7.625 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Hartford, Conn.			7.80 *R3*		9.075 *R3*	7.925 *B3*					
	Johnstown, Pa.	5.425 *B3*	5.425 *B3*		6.475 *B3*			5.10 *B3*		7.20 *B3*	7.625 *B3*	7.65 *B3*
	Fairless, Pa.	5.575 *U1*	5.575 *U1*		6.625 *U1*							
	Newark, N. J.			7.75 *W10*		8.95 *W10*						
	Camden, N. J.			7.75 *P10*		8.95 *P19*						
	Bridgeport, Conn. Putnam, Conn.	5.650 *N8*	5.650 *N8*	7.85 *W10* 7.65 *N8*	6.550 *N8*	8.925 *N8*	8.00 *N8*					
	Sparrows Pt., Md.		5.425 *B3*					5.10 *B3*		7.20 *B3*	7.20 *B3*	7.75 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Mass.	5.575 *M7*	5.575 *M7*	7.85 *B5,C14*		9.075 *A5,B3*						7.95 *A5, W6*
	Spring City, Pa.			7.75 *K4*		8.950 *K4*						
MIDDLE WEST	Alton, Ill.	5.62 *L1*										7.85 *L1*
	Ashland, Newport, Ky.							5.10 *A7,A1*		7.20 *A1*		
	Canton, Massillon, Ohio			7.30 *R3,R2*	6.475 *R3,T5*	8.775 *R3,R2, T5*						
	Chicago, Joliet, Waukegan, Ill.	5.425 *U1,R3, W8,N4,P13*	5.425 *U1,R3, N4,P13*	7.30 *A5, W10,W8, B5,L2,N9*	6.475 *U1,R3, W8*	8.775 *A5, W10,W8 L2,N9,B5*	7.925 *U1* 6.675 *W8*	5.10 *U1,A1, W8,I3*	6.175 *U1*	7.20 *U1,W8*	7.625 *U1* 7.40 *W8*	7.65 *A5,R3, W8,N4, K2,W7*
	Cleveland, Ohio	5.425 *R3*	5.425 *R3*	7.30 *A5,C13*		8.775 *A5, C13*	7.925 *R3*	5.20 *R3,J3*	6.275 *J3*		7.625 *R3, J3*	7.65 *A5, C13*
	Detroit, Mich.	5.525 *G3*	5.775 *G3*	7.30 *R5,B5*	6.475 *R5* 6.575 *G3*	8.775 *R5* 8.975 *B5,P3*	8.025 *G3*	5.70 *G3*		7.35 *G3*		
	Duluth, Minn.											7.65 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.425 *U1,I3, Y1*	5.425 *U1,I3, Y1*	7.30 *R3,M5*	6.475 *U1,I3, Y1*	8.775 *R3,M4*	7.925 *U1,I3, Y1*	5.10 *U1,I3, Y1*	6.175 *J3,I3*	7.20 *U1,Y1*	7.625 *U1, Y1*	7.75 *M4*
	Granite City, Ill.							5.30 *C2*				
	Kokomo, Ind.											7.75 *C9*
	Sterling, Ill.	5.525 *N4*	5.525 *N4*					5.10 *N4*				7.75 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.30 *C10*	6.475 *C10,S1*	8.775 *C10*	7.925 *S1*	5.10 *R3,S1*		7.20 *S1*	7.625 *R3, S1*	
	Pittsburgh, Pa. Midland, Pa. Donora, Pa.	5.425 *U1,J3, C11*	5.425 *U1,J3*	7.30 *A5,B4, R3,J3,C11, W10,S9,C8*	6.475 *U1,J3, C11*	8.775 *A5, W10,R3,S9, C11,C8*	7.925 *U1,J3*	5.10 *U1,J3*	6.175 *U1*	7.20 *U1,J3*	7.625 *U1,J3*	7.65 *A5, J3,P6*
	Portsmouth, Ohio											7.65 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.10 *W5*				
	Youngstown, Ohio	5.425 *U1,R3, Y1*	5.425 *U1,R3, Y1*	7.30 *A5,Y1, F2*	6.475 *U1,Y1*	8.775 *Y1,F2*	7.925 *U1,Y1*	5.10 *U1,R3, Y1*		7.20 *Y1*	7.625 *U1, R3,Y1*	7.65 *Y1*
WEST	Emeryville, Cal.	6.175 *J5*	6.175 *J5*									
	Fontana, Cal.	6.125 *K1*	6.125 *K1*		7.525 *K1*		8.625 *K1*	5.85 *K1*		7.95 *K1*	8.375 *K1*	
	Geneva, Utah							5.10 *C7*			7.625 *C7*	
	Kansas City, Mo.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*					7.90 *S2*
	Los Angeles, Torrance, Cal.	6.125 *C7,B2*	6.125 *C7,B2*	9.75 *R3,P14*	7.525 *B2*	10.650 *P14*	8.625 *B2*					8.60 *B2*
	Minnequa, Colo.	5.875 *C6*	5.875 *C6*					5.95 *C6*				7.90 *C6*
	Portland, Ore.	6.175 *O2*	6.175 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.125 *C7* 6.175 *B2*	6.125 *C7* 6.175 *B2*				8.675 *B2*					8.60 *C7,C6*
	Seattle, Wash.	6.175 *B2,N6*	6.175 *B2*				9.675 *B2*	6.00 *B2*		8.10 *B2*	8.525 *B2*	
SOUTH	Atlanta, Ga.	5.625 *A8*	5.625 *A8*									7.85 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.425 *T2,R3*	5.425 *T2,R3, C16*	7.90 *C16*		8.775 *R3*	7.925 *T2*	5.10 *T2,R3*			7.625 *T2*	7.65 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.675 *S2*	5.675 *S2*		6.725 *S2*		8.175 *S2*	5.20 *S2* 5.45 *L3*		7.30 *S2*	7.725 *S2*	7.90 *S2*

† Merchant Quality—Special Quality .35c higher.

STEEL PRICES *(Effective July 9, 1957)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½ 3 In.		2 In.		2½ In.		3 In.		3½ 4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	11.75	+1.50								
Youngstown *R3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fontana *K1*	+7.75	+23.0	+4.75	+19.0	+1.25	+14.50	1.25	+13.75	1.75	+12.75	2.25	+12.25	3.75	+12.50								
Pittsburgh *J3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Alton, Ill. *L1*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Sharon *M3*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Fairless *N2*	3.25	+12.0	6.25	+8.0	9.75	+3.50	12.25	+2.75	12.75	+1.75	13.25	+1.25	14.75	+1.50								
Pittsburgh *N1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Wheeling *W5*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Wheatland *W4*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50								
Youngstown *Y1*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
Indiana Harbor *Y1*	4.25	+11.0	7.25	+7.0	10.75	+2.50	13.25	+1.75	13.25	+0.75	14.25	+0.25	15.75	+0.50								
Lorain *N2*	5.25	+10.0	8.25	+6.0	11.75	+1.50	14.25	+0.75	14.75	0.25	15.25	0.75	16.75	0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	+15.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Youngstown *R3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Fairless *N2*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Fontana *K1*	+3.25	+17.0	0.75	+13.0	3.75	+8.50	4.25	+9.75	4.75	+8.75	5.25	+8.25	5.75	+9.50								
Pittsburgh *J3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Alton, Ill. *L1*	7.75	+6.0	11.75	+2.0	14.75	2.50	15.25	1.25	15.75	2.25	16.25	2.75	16.75	1.50								
Sharon *M3*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Pittsburgh *N1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling *W5*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Wheatland *W4*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50								
Youngstown *Y1*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Indiana Harbor *Y1*	8.75	+5.0	12.75	+1.0	15.75	3.50	16.25	2.25	16.75	3.25	17.25	3.75	17.75	2.50								
Lorain *N2*	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	*7.75	+21.75	*0.75	+16.0	2.25	+13.50	7.25	+8.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 10¢ per lb.

To identify producers, see Key on preceding page

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.185	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	3	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium	.83 D-3, D-5
Oil hardened manganese	.45 O-2
Special carbon	.41 W-1
Extra carbon	.345 W-1
Regular carbon	.29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (A3, J2, L4) 10 pct	Plate (A3, J2, L4) 15 pct	Plate (A3, J2, L4) 20 pct	Sheet (I2) 20 pct
Stainless Type	302				
	304	37.95	42.25	46.70	49.85
	316	44.40	49.50	54.50	54.50
	321	40.05	44.60	49.30	49.30
	347	42.40	47.55	52.80	52.80
	405	29.85	33.35	36.85	36.85
	410	29.55	33.10	36.70	36.70
	430	29.80	33.55	37.25	37.25

CR Strip (S9) Copper, 10 pct, 2 sides, 39.85; 1 side, 33.00.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field		9 625	
Armature	11.10	10 85	11.35
Elect.	11.80	11.55	12.05
Motor	12.90	12.65	13.15
Dynamo	13.95	14.75	14.20
Trans. 72	15.00		15.25
Trans. 65	15.55		
		Grain Oriented	
Trans. 58	16.05	Trans. 80	19.20
Trans. 52	17.10	Trans. 73	19.70

Producing points: Beech Bottom (W5); Brackenridge (A3); Granite City (G2); Indiana Harbor (I5); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

WARE-HOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Hot-Rolled (special quality)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.17	9.37	9.83	8.21	8.55	8.59	8.45		10.23				
Baltimore	$.10	7.88	8.98	9.24	8.36	8.26	8.75	8.53		9.13	14.99	14.11	18.39	18.09
Birmingham	.15	7.80	9.00	9.52	7.82	8.16	8.20	8.07	8.41	10.04				
Boston	.10	8.84	9.88	10.96	8.89	9.18	9.10	9.07	9.57	10.12	15.79	14.79	19.14	18.39
Buffalo	.15	8.00	9.15	10.83	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.65	19.01	18.25
Chicago	.15	8.35	9.60	10.20	8.38	8.71	8.79	8.07	8.75	8.95	15.30	14.80	18.65	18.60
Cincinnati	.15	8.09	9.20	9.80	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.61	18.96	18.21
Cleveland	.15	7.78	8.98	9.55	7.92	8.39	8.57	8.16	8.67	8.60	15.39	14.39	18.74	17.99
Denver		9.70	11.30	12.49	9.80	9.70	9.80	9.95		10.65				17.60
Detroit	.15	8.18	9.40	10.15	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	18.16
Houston		8.80	9.75		7.75	8.80	8.00	8.05		10.65	15.50		19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	8.83	8.87	8.73		9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	9.10	10.30	11.20	9.15	9.65	9.15	9.10	9.30	12.10	16.15	15.60	20.30	19.70
Memphis	.15	8.02	9.22		8.12	8.35	8.39	8.25		9.85				
Milwaukee	.15	8.48	9.73	10.33	8.51	8.84	9.00	8.88	8.71	9.18	15.43	14.93	18.78	18.73
New York	.10	8.55	9.76	10.31	9.00	9.11	9.01	9.11	9.48		15.02	14.69	18.42	18.29
Norfolk	.20	8.00			8.40	8.35	8.70	8.45		10.70				
Philadelphia	.10	8.25	9.17	10.34	8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	18.21
Pittsburgh	.15	7.78	8.99	10.90	7.92	8.16	8.20	8.22	8.50	8.60	15.30	14.30	18.65	17.90
Portland		9.20	11.20	11.55	11.05	9.00	9.35	9.35		13.80	16.70	16.10	20.40	20.25
San Francisco	.10	8.95	10.30	10.65	9.05	9.20	9.05	9.05	9.90	12.30	16.45	15.60	20.30	19.70
Seattle		9.55	10.70	11.60	9.55	9.30	9.35	9.50	9.85	13.40	16.55	15.85	19.50	19.45
Spokane	.15	9.70	10.85	11.65	9.70	9.45	9.50	9.65	10.00	13.55		16.75		20.35
St. Louis	.15	8.69	9.94	10.56	8.74	9.08	9.25	8.43	9.12	9.56	15.66	15.16	19.01	18.96
St. Paul	.15	8.79	10.04	10.66	8.84	9.30	9.38	9.22		9.66		14.62		18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
† 16 gage. †† 10½¢ zinc. ‡ Deduct for country delivery.

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢ lb.	Merch. Wire Galv. ¢ lb.
Alabama City R3	173	187		212	193	8.65	9.20
Aliquippa J5***							
Atlanta A8**							
Bartonville K2**	175	192	178	214	198	8.75	9.425**
Buffalo W6							
Chicago N4***							
Cleveland A6							
Cleveland A5						8.65	
Crawf'dsv. M4**							
Donora, Pa. A5	173	187		212	193	8.65	9.20
Duluth A5	173	187		212	193	8.65	9.20
Fairfield, Ala. T2	173	187		212	193	8.65	9.20
Galveston D4	8.95‡						
Houston S2	178	192		217	198	8.90	9.45
Johnstown B3**	173	190**			196**	8.65	9.325**
Joliet, Ill. A5	173	187		212	193	8.65	9.20
Kokomo C9*	175	189*		214	195*	8.75	9.30*
L. Angeles B2***						9.60	10.275
Kansas City S2*	178	192*		217	198*	8.90	9.45*
Minnequa C6†	178	192†	177	217	198†	8.90	9.45†
Monessen P6					193	8.65	9.20
Palmer, Mass. W6							
Pittsburg, Cal. C7	192	210			213	9.60	10.15
Rankin, Pa. A5	173	187			193	8.65	9.20
So. Chicago R3	173	187			193	8.65	9.20
S. San Fran. C6†				236		9.60	10.15†
Sparrows Pt. B3**	175			214	198	8.75	9.425
Struthers, O. Y1*							8.65
Worcester A5	179					8.95	9.50
Williamsport S5							

* Zinc less than .10¢.
** 11-12¢ zinc.
*** .10¢ zinc.
† Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26 0.40	0.41 0.60	0.61 0.80	0.81 1.05	1.06 1.35
Baltimore, Md. T8	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. W12					
Boston T8	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. R7	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. S9					
Cleveland A5					
Detroit D1					
Detroit D2					
Dover, O. G4					
Evanston, Ill. M8	9.05	10.40	12.60		
Franklin Park, Ill. T8	9.05	10.25	12.45	15.45	18.40
Harrison, N. J. C11					
Indianapolis C5					
Los Angeles					
New Castle, Pa. B4					
New Haven, Conn. D1					
Pawtucket, R. I. N7	9.50	10.70	12.90	15.90	18.85
Pittsburgh S7					
Riverdale, Ill. A1	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. S1					
Trenton R4					
Wallingford W1					
Warren, Ohio T4					
Worcester, Mass. A5					
Youngstown C5					

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	36.34	42.56	33.21	.....
	2½	12	48.94	57.31	44.73	.....
	3	12	56.51	66.18	51.66	.....
	3½	11	65.97	77.25	60.30	.....
	4	10	87.61	102.59	80.07	.....
National Tube	2	13	36.34	42.56	33.21	.....
	2½	12	48.94	57.31	44.73	.....
	3	12	56.51	66.18	51.66	.....
	3½	11	65.97	77.25	60.30	.....
	4	10	87.61	102.59	80.07	.....
Pittsburgh Steel	2	13	36.34	42.56	.....	.....
	2½	12	48.94	57.31	.....	.....
	3	12	56.51	66.18	.....	.....
	3½	11	65.97	77.25	.....	.....
	4	10	87.61	102.59	.....	.....

(Effective July 9, 1957)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.525	6.50	6.975				
So. Chicago *R3*				9.75			
Ensley *T2*	5.525	6.50					
Fairfield *T2*		6.50		9.75		6.60	
Gary *U1*	5.525					6.60	
Huntington *C16*		6.50					
Ind. Harbor *I3*	5.525		6.975	9.75		6.60	
Ind. Harbor *Y1*				9.75			
Johnstown *B3*		6.50					
Joliet *U1*			6.975				
Kansas City *S2*				9.75			
Lackawanna *B3*	5.525	6.50	6.975			6.60	
Lebanon *B3*							
Minnequa *C6*	5.525	7.00	6.975	9.75		6.60	
Pittsburgh *P5*							
Pittsburgh *J3*				9.75			
Seattle *B2*				10.25		6.75	
Steelton *B3*	5.525		6.975			6.60	
Struthers *Y1*				9.75			
Torrance *C7*						6.75	
Williamsport *S5*							
Youngstown *R3*				9.75			

COKE

Furnace, beehive (f.o.b. oven) Connellsville, Pa.	Net-Ton $15.00 to $15.75
Foundry, beehive (f.o.b. oven)	$17.50 to $19.00
Foundry oven coke	
Buffalo, del'd	$31.75
Detroit, f.o.b.	30.50
New England, del'd	31.55
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erie, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati, del'd	31.84
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa.	29.25

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100,110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
10	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

• Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	47.92
Electrodeposited	39.25
Brass, 80-20, ball anodes, 2000 lb or more	50.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 2¢ per lb)	
Nickel, 99 pct plus, rolled carbon, 5000 lb	102.25
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.70
Tin, ball anodes and elliptical $1.07 per in.	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	74.80
Copper sulphate, 100 lb bags, per cwt.	24.35
Nickel salts, single, 100 lb bags	40.50
Nickel chloride, freight allowed, 300 lb	45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.05
(Philadelphia price 23.30)	
Zinc cyanide, 100 lb	59.00
Potassium cyanide, 100 lb drum N. Y.	48.00
Chromic acid, flake type, 100,000 lb or more	31.00

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
	Pct Discounts			
½" and smaller x 6" and shorter	49	54	56	57
⅝" thru 1" x longer than 6"	35	40	43	45
Rolled thread carriage bolts ½" & smaller x 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam. longer than 6 in.	39	44½	47	48½
Plow bolts, ½" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.

	Full case or Keg price
¾ in. or smaller	60½
⅞ in. to 1 in. inclusive	55½
1⅛ in. to 1½ in. inclusive	58½
1⅝ in. and larger	53½

C. P. Hex reg. & hvy.

¾ in. and smaller	60½
⅞ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

Hot Galv. Hex Nuts (All Types)

¾ in. and smaller	46½

Semi-finished Hex Nuts

⅝ in. or smaller	60½
¾ in. to 1½ in. inclusive	55½
1⅝ in. and larger	53½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller	63

Rivets

	Base per 100 lb
½ in. and larger	$12.25
	Pct Off List
7/16 in. and smaller	19

Cap Screws

	Discount (Packages) Full Finished H. C. Heat Treat	
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	40	26
¾" ⅞" and 1" diam. x 6" and shorter	22	3
⅝" diam. and smaller x longer than 6"	8	+13
¾", ⅞", and 1" diam. x longer than 6"	+6	+32

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	58	49
¾" through 1" dia. x 6" and shorter	45	33

Minimum quantity—¼" through ⅝" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Quantity	Discount Mach. Screws	Stove Bolts
Cartons		19	32
Bulk			
To ¼" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	15,000-100,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screws & Stove Bolt Nuts

	Quantity	Discount Hex	Square
In cartons		16	19
In Bulk			
⅜" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.7
Chicago	134.1
San Francisco-L. A.	141.8

Dec. 1955 value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00)	$135.00
No. 1 Ohio	120.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $2.00)	21.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$150.00
Childs, Hays, Pa.	155.00
Chicago District	160.00
Western Utah	175.00
California	180.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	157.00-160.00
Silica cement, net ton, bulk, Latrobe	28.50
Silica cement, net ton, bulk, Chicago	25.50
Silica cement, net ton, bulk, Ensley, Ala.	26.50
Silica cement, net ton, bulk, Mt. Union	24.50
Silica cement, net ton, bulk, Utah and Calif.	37.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$105.00
Standards chemically bonded, Curtriner, Calif.	115.00
Burned, Balt.	99.00

Magnesite Brick

Standard, Baltimore	$131.00
Chemically bonded, Baltimore	116.00

Grain Magnesite

St. ⅝ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.	
in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in:	
Pa., W. Va., Ohio	$16.00
Midwest	16.35
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron, del. East of Miss. River, ocean bags, 23,000 lb. and over	10.5¢
F.O.B. Riverton or Camden, New Jersey, West of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe, 23,000 lb. and over del'd East of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West of Miss. River	9.5¢
Canadian sponge iron, del'd in East, carloads	9.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 3 to 20 micron, 98%, 99.8+% Fe	88.0¢ to $2.90
Aluminum, freight allowed	38.00¢
Brass, 10 ton lots	37.4¢ to 41.5¢
Copper electrolytic	45.75¢
Copper, reduced	49.75¢
Cadmium, 100-199 lb. 95¢ plus metal value	
Chromium, electrolytic, 99.85% min. Fe .03 max. Def'd	$5.00
Lead	8.90¢ plus metal value
Manganese f.o.b. Extron, Pa.	16.0¢
Molybdenum, 99%	$3.60 to $3.95
Nickel, chemically precipitated	$1.05
Nickel, unannealed	$1.00
Nickel, annealed	$1.06
Nickel, spherical, unannealed #80	$1.13
Silicon	43.50¢
Solder powder 7.0¢ to 9.0¢ plus met. value	
Stainless steel, 302	$1.02
Stainless steel, 316	$1.20
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh) $3.75 (nominal)	
Zinc, 10 ton lots	18.5¢ to 31.7¢

Weight—
29,500 lbs.

PRECISION
GRAY IRON • ALLOY IRON • DUCTILE IRON
CASTINGS

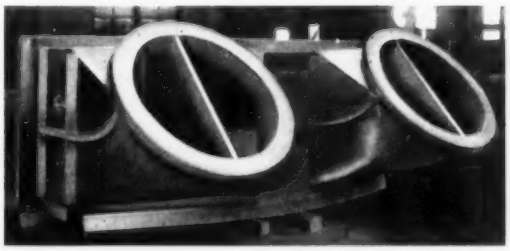
CEMENT BONDED SAND METHOD

CHAMBERSBURG
ENGINEERING COMPANY

PHONE CASTING SALES DEPT.

562 Derbyshire Street **Chambersburg, Penna.**

KUTZTOWN *Skill*
creates a WATER BOX



This end section of a Water Box for a power plant condenser system was dry sand molded of Hi-Tensile Iron including alloy of nickel, chrome and molydenum.

It weighs approximately 35,000 lbs. and has a tensile strength of 50,000 psi. Six complete boxes were molded and machined in our plant for this customer.

No order is too large or small for Kutztown to handle. Your inquiry is most welcome.

We'll be happy to place your name on our mailing list to receive regular issues of the "Kutztown REVIEW."

KUTZTOWN FOUNDRY & MACHINE CORP.
KUTZTOWN, PENNSYLVANIA

11' 1" diameter x 250' 0" high, butt welded, self-supporting steel open hearth stack for a leading steel producer.

TALL Against the Sky...

. . . this stack was furnished and fabricated complete including breeching section, in our Youngstown, Ohio, plant. It was shipped knocked down to the job site via rail. There, our construction department took over and erected the stack as shown in record time.

The Youngstown Steel Tank Company maintains a complete stack service including design, fabrication, construction, inspection and repair. We specialize in the steel producing and petro-chemical processing industries.

The YOUNGSTOWN STEEL TANK COMPANY
Youngstown, Ohio

FERROALLOY PRICES

(Effective July 9, 1957)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si... 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 1% max Si... 35.50
8.50% max. C, 50-55% Cr, 3-6% Si.. 24.00
8.50% C, 50-55% Cr, 3% max. Si... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max c 10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe...	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (¼" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 8-in. x down, per lb of Cr, packed.

Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ¼ in. x 12 mesh.

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.60
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si....	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots, packed	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	15.10
Ton lots, packed, pallets	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe..	22.20	20.90
98% Si, 0.75% Fe	22.95	21.65

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si ...	13.00	75% Si ...	16.40
65% Si ...	15.25	85% Si ...	18.10
	90% Si ...	19.50	

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots..	2.40	3.30	4.55

Alsifer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound Contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$4.90
Less ton lots	4.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd ton lots, 2-in. x D per lb con't Sb plus Ta $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth Pa., per pound contained Mo $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¾ x down packed, per pounds contained W, ton lots delivered ..... $2.60 (nominal)

Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa. Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 contract, basis, per pound contained V_2O_5 ..... $1.38

Zirconium contract basis per lb of alloy
35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B

2000 lb carload	$5.50

Bortam, f.o.b. Niagara Falls,

Ton lots per pound	45¢
Less ton lots, per pound	50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn. 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.

Ton lots	$1.46
Less ton lots	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots $2.15

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3. Hydraulic Hose, Couplings

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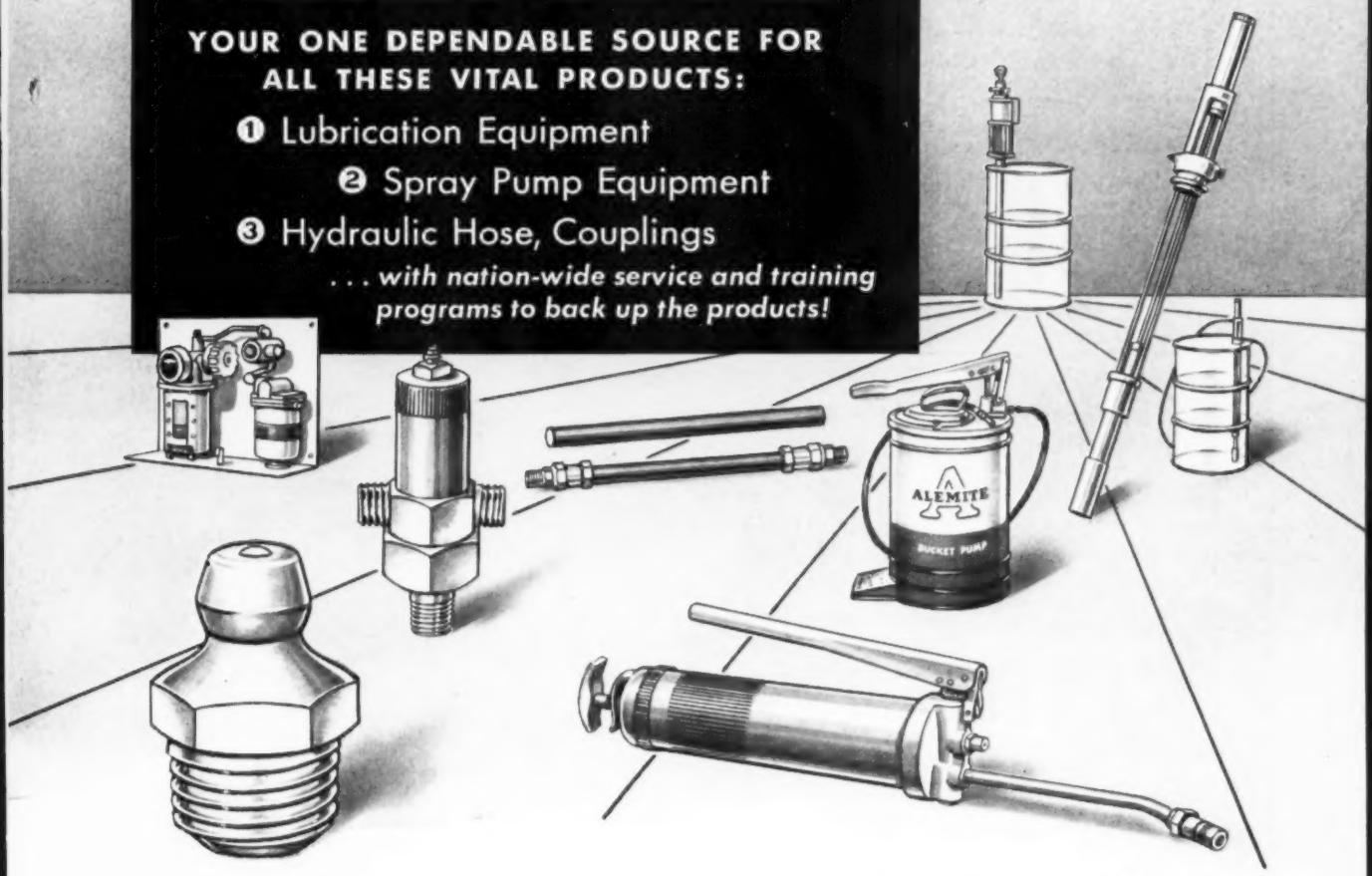

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"BARREL-TO-BEARING"	Manual and Power Operated Pumps and Guns
Spray Pump Equipment	ALEMITE Versatal SPRAY PUMP EQUIPMENT
SURGEPRUF	Hydraulic Hose and Couplings

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"ANYTHING containing IRON or STEEL"

Steel's Pace Helps Pittsburgh Sales

Used machine dealers there, whose industrial pulse follows steel's, are encouraged by current operating rate.

With prospect of a good second half for steel they look for even better machine sales in balance of '57.

▪ The Pittsburgh market for used machinery is reflecting developments in the steel industry, which dominates the district's industrial activity.

Steel mills there are still operating at a healthy 90 pct of capacity, and they expect to have a strong fourth quarter. This activity shows up in the business of one dealer who sells motors, generators and other types of electrical equipment. Sales in this field are tied to daily operations at the mills.

Never Better — In the current situation, the dealer reports booming sales. June will be 100 pct better than any month in the past 30 years. In a normal period, the same dealer figures on one order for every 10 quotations. Today he is getting six orders for every 10 quotations. He looks for business to continue good through the fall.

At the same time, there has been a drop in steel operating rates. Business is still good but it is not as good as it was a few months ago. This has left steel men a little hesitant about major new projects. They have slowed their buying of heavy, specialized production equipment.

Foreign Sales Strong — Dealers who specialize in mill equipment say the domestic market is going through a lull. They look for a pickup in the fall but meanwhile they are getting most of their action from foreign buyers. South America is particularly active. Recent shipments include plate mills and furnaces. There is a steady call for bar mills but these are just not available.

A dealer in machine tools reports a recent order pickup and thinks this year may reverse the 1956 pattern through a strong second half after a sluggish start. Radial drills and lathes are moving well. The majority of the area's bigger plants are coming to dealers for equipment for modernization projects. The price pinch continues as machinery sellers try to get back a portion of the higher prices they are paying for new models.

Tight Money Aids—A dealer in specialized handling equipment finds business good. He says there are fewer inquiries today but a higher percentage of sales. There is less idle shopping and money appears to be an important factor. Same dealer feels the tight money situation is working in favor of used machiney.

A crane dealer reports a widespread pickup in interest. Recent inquiries have come in from Colorado, Utah, Arizona, and the East Coast. Customers are looking for cranes ranging up to 20 tons capacity. Most seem to be after wide spans up to 80 ft.

In general the outlook is for an improvement in the second half. Much depends on what happens in the steel industry and dealers say the mills are talking confidently.

CONSIDER GOOD USED EQUIPMENT FIRST

AIR COMPRESSOR
450 cu. ft. Ingersoll Rand XRE, 100# Pressure 100 H.P. Westinghouse Motor 440-3/60

BENDER & STRAIGHTENER
Pels Type JH-26 Bends & Straightens Beams 15x5.84 #60 lb., Angles Equal 8x8x1⅛", etc.

BENDING ROLLS
10' x ⅜" Kling Pyramid Type—LATE
16' x ⅝" Ransome, Pyramid Type
20' x 1" Hilles & Jones Pyramid Type

BRAKES—LEAF TYPE
8' x 3/16" Dreis & Krump
12' x ¼" Dreis & Krump
12' x ½" Dreis & Krump No. 228

BRAKES—PRESS TYPE
14' x ¾" Superior Hydraulic—NEW

BUILDINGS
50' x 760' x 30'
50' x 325' x 21'

BULLDOZERS
27" Ajax, 22" Stroke, 12"x65" Face of Crosshead
27 W&W, 22" Stroke, 16x80" Face of Crosshead

CORRUGATING MACHINE
12" Stanco Corrugating Machine, Rolls 24" Dia.

CRANES—OVERHEAD ELECTRIC TRAVELING

3 ton P&H	56' Span 220/3/60
5 ton Whiting	48' Span 230/3/60 A.C.
5 ton Case	59' Span 220/3/25
8 ton P&H	53' Span 220/3/60
10 ton Shepard Niles	38' Span 440/3/60
15 ton Shepard Niles	52' Span 230 Volt D.C.
15 ton Shepard Niles	37' Span 220/440 A.C.
15 ton Shepard Niles	55' Span 220/440 A.C.
15 ton Niles	77' Span 220/3/60
20 ton P&H	57' Span 220/440 A.C.
25 ton Cleveland	70' Span 220/3/60
With 10 ton Auxiliary (Mill Type)	

DIEING MACHINE
60-ton Henry & Wright, Roll Feed, Scrap Cutter 4" Stroke NEW 1950

DRAW BENCH
10,000# Aetna Standard Single Draw Tube Draw Bench 44 Ft. Max. Length of Draw

FORGING MACHINES
15" to 25" Acme, Ajax, National

HAMMERS—BROAD DROP—STEAM DROP—STEAM FORGING 800 lb. to 20,000 lb.

LEVELER—ROLLER
57" Torrington, 19 Roll 1-31/32" Dia. Backed up 42" Bliss, Capacity .125" LATE
54 McKay, 17 Rolls, 3⅜" Dia.
108" American 17 Rolls 4½" Dia.

PLANER—PLATE EDGE
57" Southwark, 16 Pneu. Jacks, Capy. 1½"

PRESSES—HYDRAULIC
800 ton Clearing, 48" Stroke, Bed 18 x 18"
2000 ton Bliss Hydro-Dynamic, 18" Stroke Bed Area 54" x 55"
1500 Baldwin Lima-Hamilton Hydr. Forging Press

PRESSES—TOGGLE DRAWING
#3½ Bliss 125 ton, Bolster 19" x 26"
#3018 Bliss 1250", Die Space 60" x 72"

PUNCH & SHEAR COMBINATIONS
Cleveland Style G Single End, 60" Throat
Cleveland Style W, 60" Throat
No. 1½" Buffalo Universal Ironworker

ROLLING MILLS
6" x 5" Torrington Wire Flattening Mill Line
10" x 14" Single Stand Two High
10" x 16" Single Stand Two High
12" x 12" Single Stand Two High
12" x 16" Single Stand Two High
16" x 30" Farrel Two Stand Two High
20" x 72" Cold Rolling Mill

ROLL—FORMING
11 Stand Dahlstrom, Takes widths to 8"

SHEAR—ALLIGATOR
No. 4 Mesta RH LK. Capacity 2" x 12"

SHEAR—BAR
18" Mesta Bar Shear, Capacity 4" x 35" Slabs Hot.

SHEAR—GATE
12' x ¼" Niagara Model 1212, NEW 1951

SHEAR LINES
36" Haliden Shear Line
60" Shear Line, With Leveller & Tables
96" x 14 Ga. Cleveland, With Playoff, Leveller, Elect.

SHEARS—SQUARING
6' x 10 Ga. Niagara No. 672
8' x ¼" Niagara, NEW 1952

ROLLS—PLATE STRAIGHTENING
72" Hilles & Jones 6 Rolls 11" Dia.
60" Niles-Bement-P. 7 Rolls 10¾" Dia.

SHEARS—ANGLE
6"x6"x⅞" Hilles & Jones
8"x8"x1" Long & Allstatter

SLITTER
24" Yoder Slitting Line
36" Pasco Slitting Line

STRAIGHTENER
No. 3 Medart 3 Roll Capacity to 4½" Tubing
Kane & Roach Roll Straightener & Cut-off Capacities ⅛" to ⅞" Hex. Bars

SWAGING MACHINES
#1 Fenn, Capacity 2¾" Tubing, LATE
2½"x3 Fenn, Capacity 2¾" Tube 35" Solid 10" Die Length Hydraulic Feed, LATE

TUBE MILL
Etna 1K Welded Tube Mill, Cut-off & Transformer 6" OD ½" OD 0.28 wall to 2" OD .120 wall

WELDERS—SEAM
200 KVA Progressive Universal 220 Volt
100 KVA Federal Circular 440 Volt
500 KVA Federal Longitudinal 440 Volt

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ELECTRIC POWER EQUIPMENT
DC MOTORS

Qu.	H.P.	Make	Type	Volts	RPM
2	2200	G.E.	MCF	600	400/500
3	1375	G.E.	MCF	415	1300
1	1200	G.E.	MCF	600	450/600
1	940	Whse.	QM	250	140/170
1	800	Whse.		230	250/550
		With United Gear Set 7:1 Ratio			
3	450	Whse.		550	415
2	300	G.E.	MPC	230	400
1	250	G.E.	MPC	230	400/600
2	200	Whse.	CB-207.4	250	850/1200
1	150	G.E.	CD B.B.	600	250/700
1	150	Cr.Wh.	65-H	230	1150
1	125	Whse.	SK-185	230	350/1050
1	125	Whse.	SK-183	230	850
2	100	Whse.	SK-181	230	450/1000
1	60/100	G.E.	RF-17	230	450/900
2	75	Cr. Wh.	53 H TEFC	230	860
1	50	G.E.	MD-412-AE	230	550
6	40	Rel.	385F TEFC BB	230	500/1500
2	30/40	Whse.	SK-131.5-BB DP	230	500/1500
3	(unused) 30	G.E.	CDM-85 BB	230	2200

MG SETS — 3 Ph. 60 Cy.

Qu.	KW	Make	RPM	DC Volts	AC Volts
2	2000/2400	G.E.	450	250/300	2300/4600
1	2000	G.E.	500 25 cy.	660	11000
1	2000	G.E.	514	600	2300/4600
1	1500	G.E.	720	600	6600/13200
3	1000	G.E.	720	600	6600/13200
2	1000	G.E.	514	600	6600/13200
1	750	G.E.	720	125/250	2300/4600
1	500	Whse.	900	125/250	440
2	300	G.E.	1200	250	2300
2	300	Whse.	1200	275	440/2300
1	200	Whse.	1200	550	2300
1	200	G.E.	1200	250	440

TRANSFORMERS

Qu.	KVA	Make	Type	Ph.	Voltages
1	3000	A.C.	OISC	3	3300 x 2300
1	1500	G.E. auto.	HT	3	4000/4200/4400
3	1000	G.E.	HVDDJ	1	2400 x 480
3	1000	G.E.	OA/FA	1	13800 x 230/460
1	833	G.E.	H	1	13800 x 460
2	750	G.E.	Pyranol	1	4800 x 83/55
3	500	Kuhl.	OISC	1	13200 x 6600
1	500	G.E.	OISC	1	13200 x 2300
1	500	G.E.	HS	1	13800 x 600
1	300	G.E.	HT	3	4160 x 480-277
1	200	G.E.	AirCooled	3	432/480 x 120/208Y
3	150	G.E.	OISC		33000 x 2300/4000Y
1 (unused)	50	G.E.	Askerel filled	3	13200 x 120/208Y

BELYEA COMPANY, INC.
47 Howell Street, Jersey City 6, N. J.

REBUILT—GUARANTEED ELECTRICAL EQUIPMENT
SLIP RING MOTORS
Constant Duty—3 phase, 60 cycle

Qu.	H.P.	Make	Type	Volts	R.P.M.
2	2500	Whse.	CW	1600/2300	720
1	2500	G.E.	MIII	2300	240
1	1800	Whse.	Mill	6600/4000	270
2	1800	Whse.	Mill	2200	252
2	500	Al. Ch.	ARY	2300	585
1	500	G.E.	I-M	2200	450
1	400	Al. Ch.	ARY	2200	585
1	400	Whse.	CW	2200	290
1	350	G.E.	I-M-15B	2260	1150
1	350	G.E.	MT-412	2200	450
1	300	Whse.	CW-1012	2300	290
1	250	Al. Ch.	ARY	440	705
1	250	G.E.	MT-414	2200	300
1	200	G.E.	I-M	2200	1760
2	200	G.E.	I-17-M	2200	585
1	200	G.E.	I-14-M	2200	400
1	150	Al. Ch.	ARY	440-220	720
1	150	Whse.	CW	4160-2300	585
1	150	Whse.	CW-1000	440	435
1	100	Whse.	CW	440-220	1160
1	100	El. Dy.	EDX612	2300	900
2	100	G.E.	MT-562	440-220	570
2	100	G.E.	I-13A-M	2300	495
1	100	Al. Ch.	ARY	440	430

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3 Phase, 60 Cycle

Qu.	H.P.	Make	P.F.	Volts	R.P.M.
1	1750	G.E.	100	2200	3600
1	1500	G.E.	80	2400/4160	900
1	1500	Whse.	80	2300	514
1	920	G.E.	80	2200/440	300
1	710	G.E.	80	2300	720
1	450	Whse.	100	2200	1285
3	250	G.E.	100	2300	900
1	300	G.E.	100	2300	720
1	300	G.E.	80	2200	600
2	300	G.E.	80	440	400
2	250	Whse.	80	440	600
1	200	Al. Ch.	160	2200	514
1	200	Al. Ch.	100	2200	360
1	150	G.E.	100	2200	900
1	150	El. Mchy.	80	220	720
1	150	G.E.	100	550	600
3	125	G.E.	80	4000/2200	1200
1	125	G.E.	80	2200	900
2	100	Whse.	80	440-220	1800
1	100	Ideal	80	440-220	900
2	100	G.E.	80	440-220	600
1	100	El. Mchy.	100	440-220	360
2	50	G.E.	80	2200	600

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Threader, 9/16" National precision thread roll
Threader, Type R Economy threader and pointer
Sloter, 36" Rockford hydraulic vertical, late MD
Shaper, 36" Rockford openside universal shaper-planer, mechanical
Roll, No. 1L Kane & Roach vertical bending
Roll, No. 18 Kane & Roach straightening
Planer, 30" x 30" x 8' Cincinnati, two rail, one side head
Lapper, No. 2 Cincinnati centerless, MD
Hone, No. 224-B Barnes hydraulic single spindle
Engraver, Model BL 2416 Pratt & Whitney Keller, 3 spindle
Compressor, 650 CFM Sullivan Class WJ-3 angle compound
Compressor, 390 CFM Ingersoll Rand type XRE, 2 stage
Cut-off, 6" capacity Campbell "Cutamatic" abrasive
Cut-off, No. 2A Modern automatic, late

SAWS
10½" x 10½" No. 3 Motch & Merryweather cold metal
10" x 10" Racine hydraulic shear cut
6" x 6" Peerless universal
6" x 6" No. 6 Marvel high speed

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750 ton No. 3 National Maxi-press, all steel, forging, late
106 ton No. 78 Toledo S.C., overhanging, gap (two)
60 ton Henry & Wright high speed, dieing
50 ton Henry & Wright high speed, dieing (two)
95 ton No. 8 Bliss Consolidated OBI, MD
60 ton No. 60OB Perkins, OBI
800 ton Model 2E48-800 Hamilton S.S., S.C., air clutch, late
113 ton No. 66 Bliss Consolidated S.S., tierod frame, DBG
106 ton No. 56 Toledo, S.S., S.G., tierod (three)
250 ton Williams & White 4 post hydraulic
150 ton HPM Hydro-Power Fastraverse, hydraulic
100 ton HPM Hydro-Power hydraulic
350 ton No. 18T Cleveland double action, toggle drawing, S.C.
260 ton No.796½-72 Toledo double crank, toggle drawing
120/180 ton No. 174-S Toledo double action, toggle drawing, S. C.
200 ton No. 7 x 72" Bliss double crank s.s. tierod
126 ton Model 60D66 Cleveland s.s. double crank, tierod
600 ton No. 664 Toledo knuckle joint coining

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1—10" ROD MILL.
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1—1200 HP GEAR DRIVE, 353 to 94.6 RPM, 3.73 to 1 ratio.
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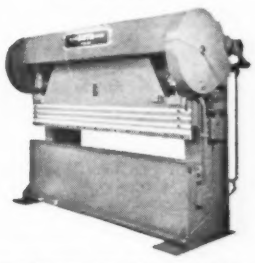

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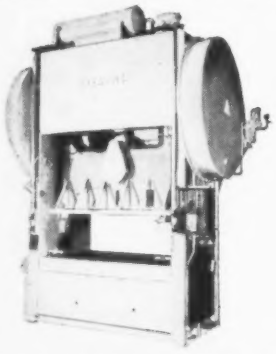

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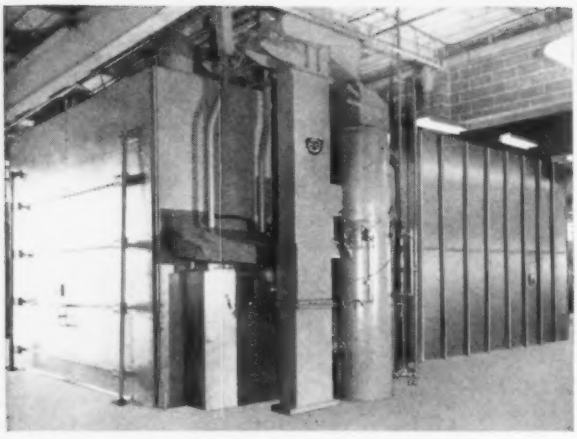

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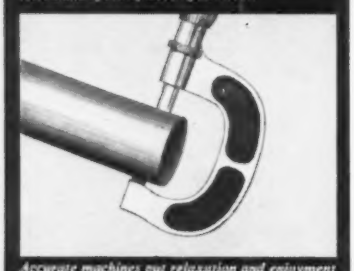

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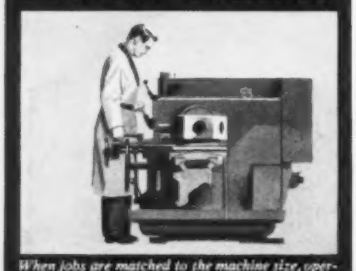

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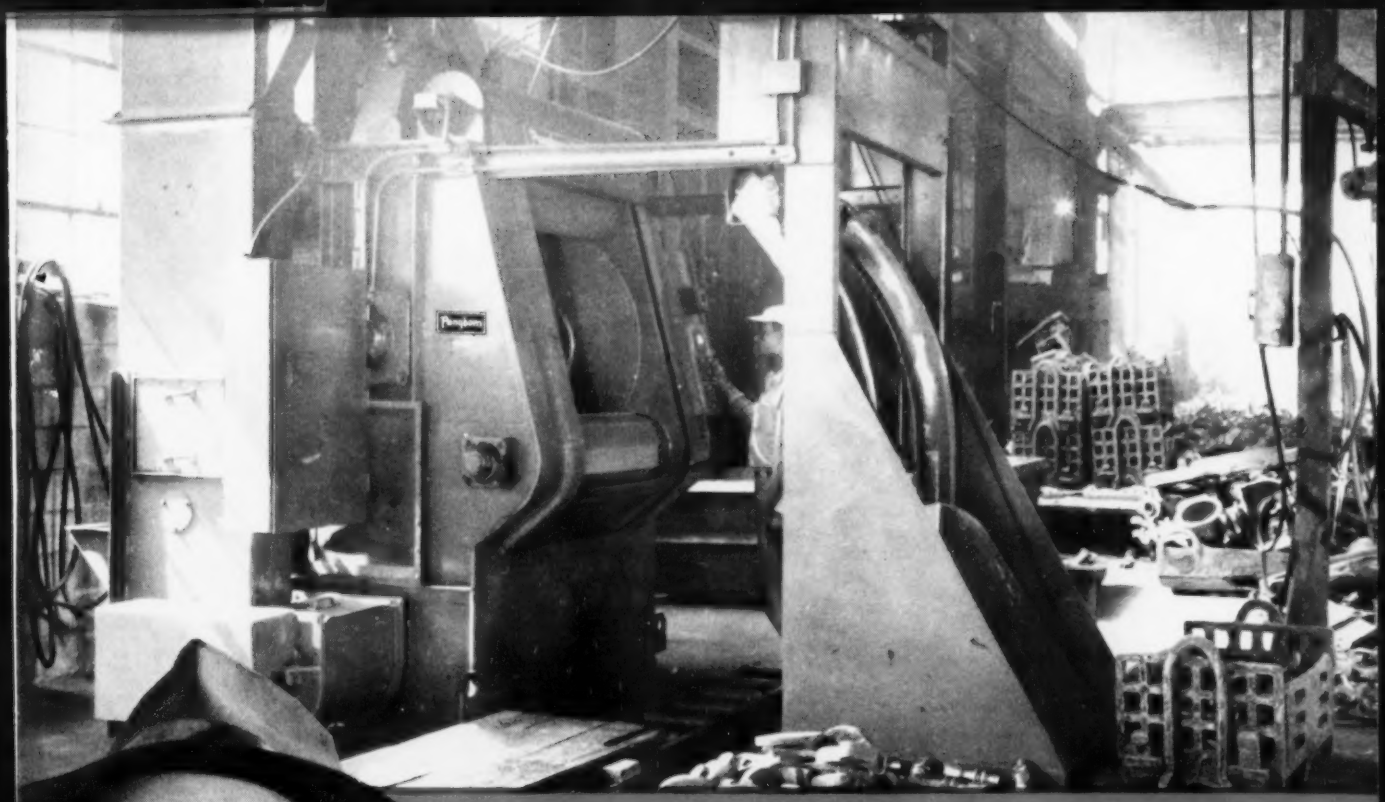

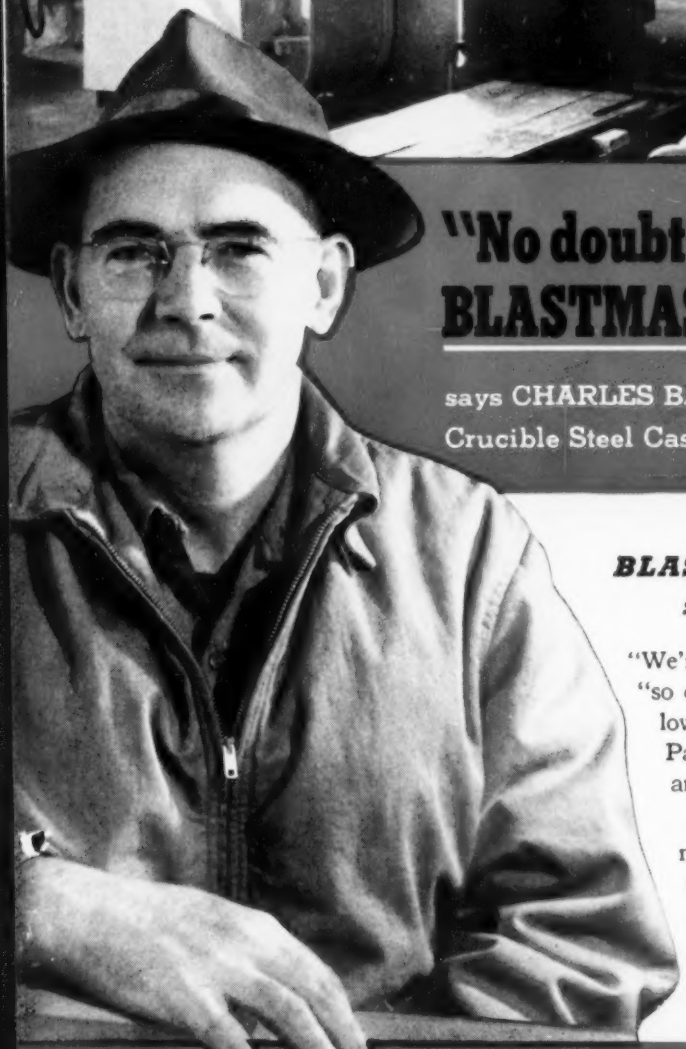

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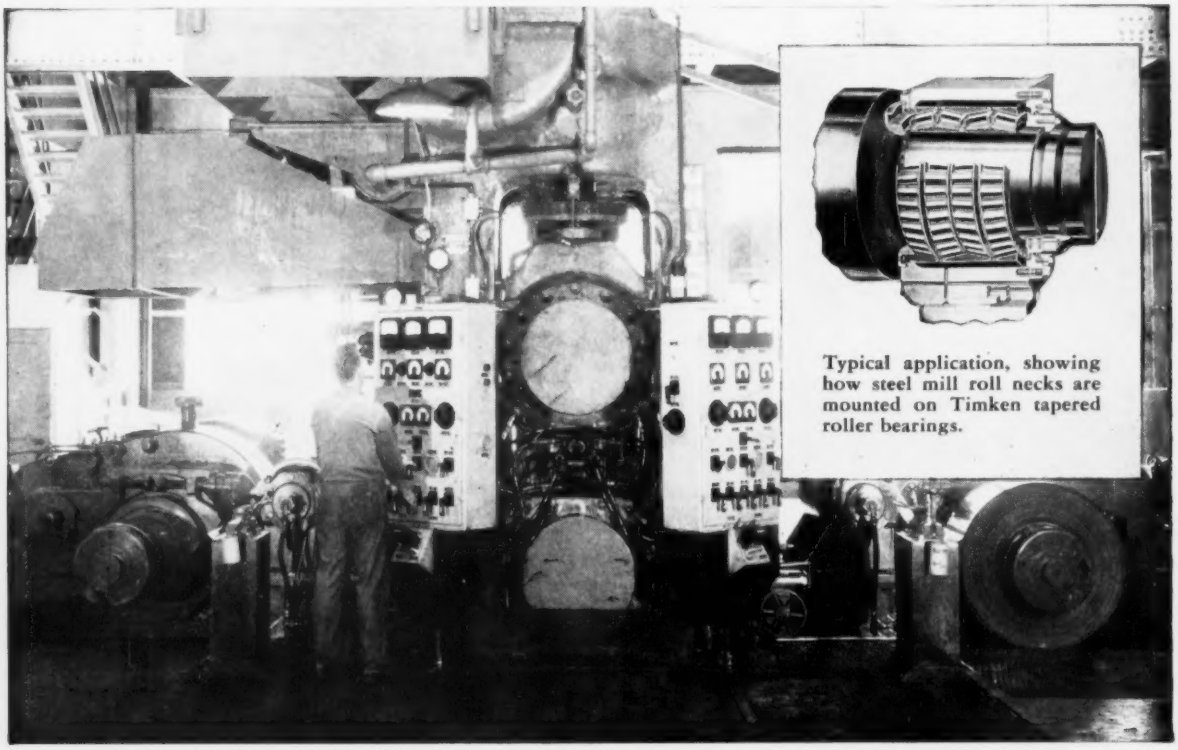

Typical application, showing how steel mill roll necks are mounted on Timken tapered roller bearings.

THE back-up rolls on this United Engineering 6″ & 34″ x 30″ 4-high reversing cold mill at Allegheny Ludlum's Leechburg plant are mounted on Timken® tapered roller bearings. Timken bearings give low torsional resistance, regardless of operating speed or load. This eliminates the need for altering or relieving screw-down pressure — maintains gauge which minimizes scrap loss at each end of the coil. Less hydraulic accumulator pressure is needed with rolls driving easier on Timken bearings, which reduces bearing wear, cuts maintenance cost.

The balanced proportion design of Timken bearings provides maximum capacity in a given space. Timken tapered roller bearings give you greater mill rigidity, permit large diameter roll necks. They take both radial and thrust loads in any combination, require *no extra thrust devices*—which means more compact chuck mountings, simplified mill design. And by holding mill rolls rigid, Timken bearings help insure "on-gauge" operation, cutting scrap loss and reducing still further the cost per ton of steel rolled.

With Timken bearings, roll and chuck are held concentric, making closures more effective. There's less leakage of lubricant. And with economically grease-lubricated Timken bearings, lubrication requires no tubes, pipes or reservoirs. When you build or buy machinery, look for the trademark "Timken". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

TIMKEN *TAPERED ROLLER BEARINGS ROLL THE LOAD*

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